

LOCUS MAP  
SCALE: 1"=1,200'

APPLICANT:

WOODLANDS AT LAUREL HILL, LLC  
676 ELM STREET, SUITE 300  
CONCORD, MA 01801  
PH: (978) 369-4884  
FAX: (978) 369-4983

PROJECT MANAGER:

EQUITY ALLIANCE CORPORATION  
32 ELK DRIVE  
BEDFORD, NH 03110  
PH: (603) 472-3808  
FAX: (603) 471-0782

CIVIL ENGINEER/LAND PLANNERS:

PLACES SITE CONSULTANTS, INC.  
694 MAIN STREET, SUITE 3  
HOLDEN, MA 01520-1862  
PH: (508) 829-0333  
FAX: (508) 829-0904

LANDSCAPE ARCHITECT:

HAWK DESIGN, INC.  
277 MAIN STREET  
CHARLESTON, MA 02129  
PH: (617) 999-9999  
FAX: (617) 999-9999

LAND SURVEYOR:

STAMSKI AND McNARY, INC.  
80 HARRIS STREET  
ACTON, MA 01720  
PH: (978) 263-6585  
FAX: (978) 263-9883

METLANDS/BIOLOGY CONSULTANT:

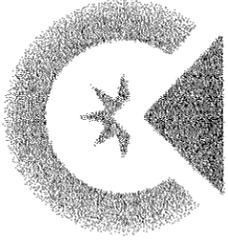
OXBOW ASSOCIATES, INC.  
409 MASS AVENUE, SUITE 201  
P.O. BOX 971  
ACTON, MA 01720-0971  
PH: (978) 929-9056  
FAX: (978) 635-1892

SANITARY ENGINEER:

RIZZO ASSOCIATES  
ONE GRANT STREET  
FRAMINGHAM, MA 01701-9005  
PH: (508) 903-2000  
FAX: (508) 903-2001

TRAFFIC CONSULTANT:

VANESSE & ASSOCIATES, INC.  
10 NEW ENGLAND BUSINESS CENTER DRIVE  
SUITE 314  
ANDOVER, MA 01810  
PH: (978) 474-8800  
FAX: (978) 688-6508



# The Woodlands at Laurel Hill



SITE MAP  
SCALE: 1"=400'

FOR PERMITTING PURPOSES ONLY  
NOT FOR CONSTRUCTION

PLAN INDEX

NOTE 1  
GENERAL NOTES, LEGEND & ABBREVIATIONS

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E-1 AFFECTED PARCELS & RECORD OWNERS

EC-1 EXISTING CONDITIONS & DEMOLITION PLAN

S-1 to S-6 DEFINITIVE SUBDIVISION PLAN  
SP-1 to SP-5 SITE PLANS

GD-1 to GD-5 GRADING & DRAINAGE PLANS  
PP-1 to PP-4 ROADWAY PLAN & PROFILE

U-1 to U-4 UTILITY PLANS  
LS-1 to LS-3 SEWER PUMP STATION DETAILS

D-1 to D-6 CONSTRUCTION DETAILS  
ES-1 EROSION & SEDIMENTATION CONTROL NARRATIVE PLAN

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W-7 & W-17 WASTEWATER TREATMENT PLANT PLANS

## The Woodlands at Laurel Hill

October 19, 2005

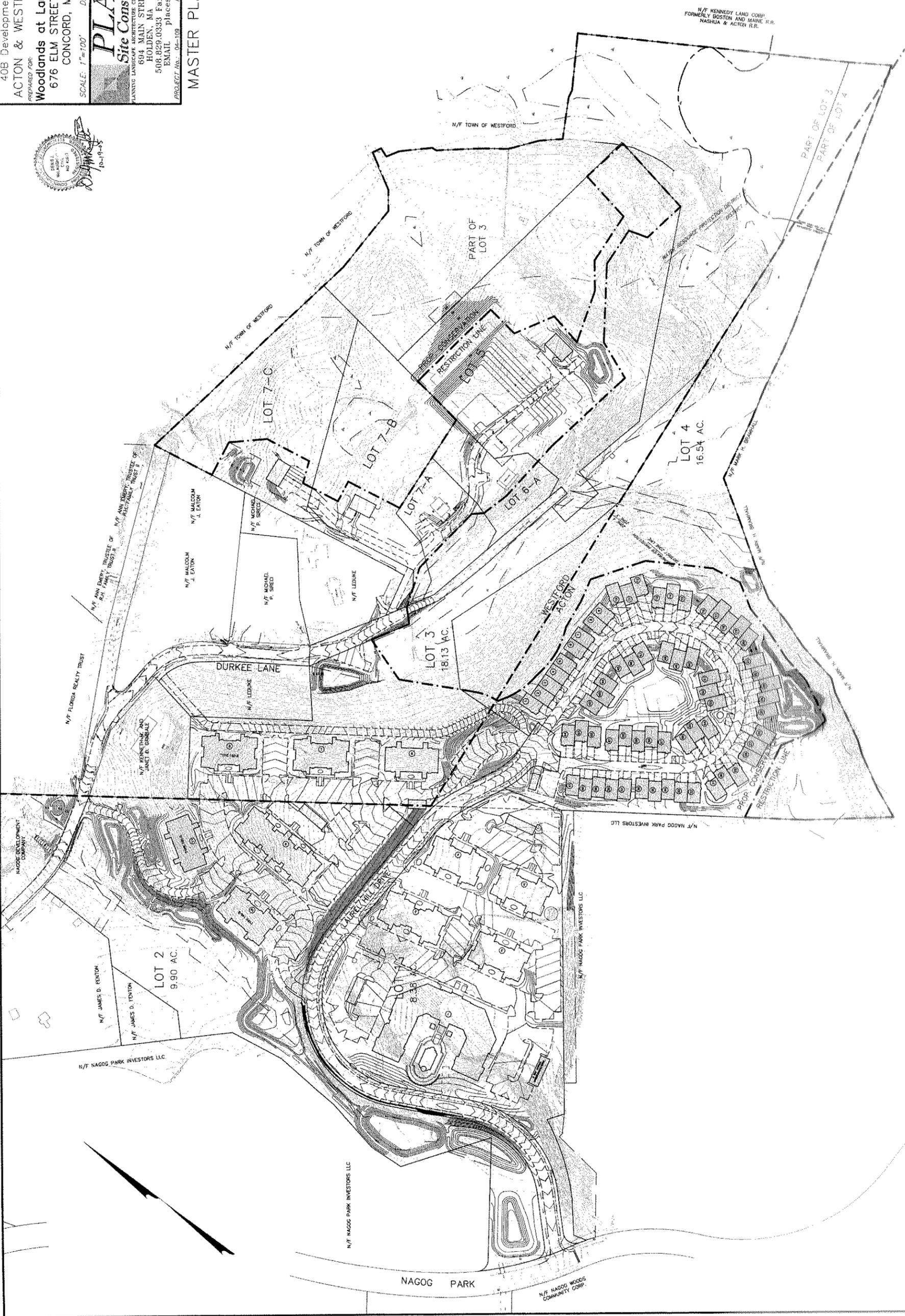
Comprehensive  
Permit Plans



40B Development Plan in  
 ACTON & WESTFORD, MASS.  
 PREPARED FOR:  
**Woodlands at Laurel Hill, LLC**  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801

SCALE: 1"=100' DATE: October 19, 2005  
**PLACES**  
**Site Consultants, Inc.**  
 PLANNING LANDSCAPE ARCHITECTURE CIVIL ENGINEERING SURVEYING  
 694 MAIN STREET, SUITE 3  
 HOLDEN, MA 01520-1862  
 508.829.0333 Fax 508.829.0904  
 EMAIL: places@verizon.net  
 PROJECT No.: 04-108 PLAN No.: 100-SP-1

**MASTER PLAN**



N/F KENNEDY LAND CORP.  
 FORMERLY BOSTON AND MAINE R.R.  
 NASHUA & ACTON R.R.

PART OF LOT 3  
 PART OF LOT 4

N/F TOWN OF WESTFORD

LOT 7-C

LOT 7-B

LOT 7-A

LOT 3  
 18.13 AC.

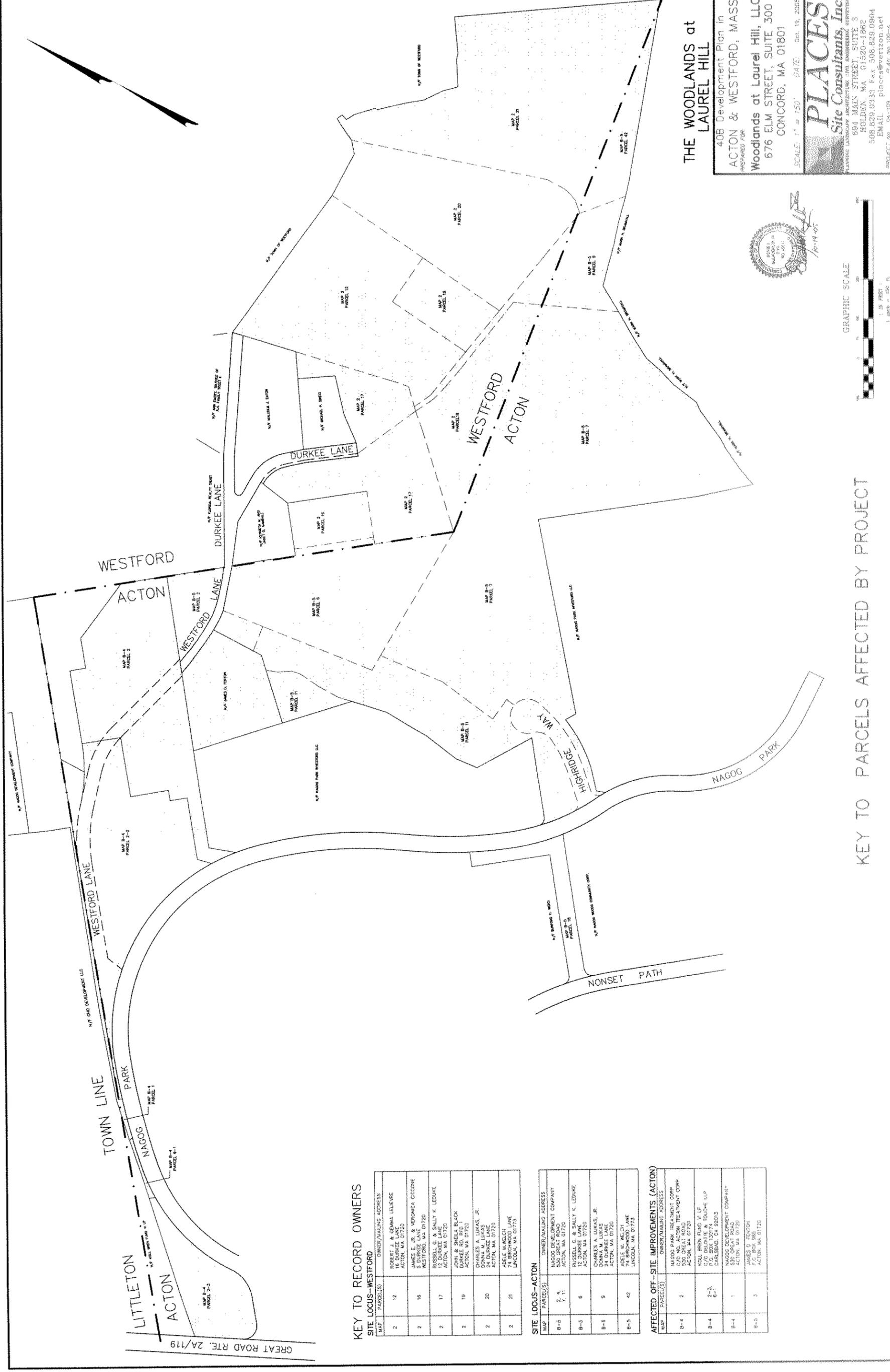
LOT 4  
 16.54 AC.

DURKEE LANE

LOT 2  
 9.90 AC.

NAGOG PARK

N/F NAGOG WOODS  
 COMMUNITY CORP.



**THE WOODLANDS at LAUREL HILL**

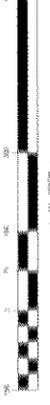
40B Development Plan in  
**ACTON & WESTFORD, MASS**  
 Prepared for:  
**Woodlands at Laurel Hill, LLC**  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801

SCALE: 1" = 150' DATE: Oct. 19, 2005

**PLACES**  
 Site Consultants, Inc.  
 PLANNING LANDSCAPE ARCHITECTURE CIVIL ENGINEERING SURVEYING  
 694 MAIN STREET, SUITE 3  
 HOLDEN, MA 01520-1862  
 508.529.0933 Fax 508.829.0904  
 EMAIL: places@verizon.net  
 PROJECT NO. 04-109 DATE: 10-19-05



GRAPHIC SCALE



1" = 150'

**KEY TO RECORD OWNERS**

**SITE LOCUS--WESTFORD**

MAP PARCEL(S)	OWNER/MAILING ADDRESS
2 12	ROBERT J. & DOMINA LEBLANC 18 DURKEE LANE ACTON, MA 01720
2 16	JAMES E. JR. & VERONICA CICCHIO 5 DURKEE LANE WESTFORD, MA 01720
2 17	RUSSELL G. & SALLY K. LEDUKE DURKEE RD. RD 1 ACTON, MA 01720
2 19	JOHN & SHELIA BLACK DURKEE RD. RD 1 ACTON, MA 01720
2 20	CHARLES A. LUKAS, JR. DONNA M. LUKAS ACTON, MA 01720
2 21	SELE M. MARCH 74 BIRCHWOOD LANE LANSLOW, MA 01773

**SITE LOCUS--ACTON**

MAP PARCEL(S)	OWNER/MAILING ADDRESS
B-5 2, 4, 7, 11	NAGOG DEVELOPMENT COMPANY 500 GREAT ROAD ACTON, MA 01720
B-5 6	RUSSELL G. & SALLY K. LEDUKE 12 DURKEE LANE ACTON, MA 01720
B-5 9	CHARLES A. LUKAS, JR. 24 DURKEE LANE ACTON, MA 01720
B-5 42	ADELE M. MELCH 74 BIRCHWOOD LANE LANSLOW, MA 01773

**AFFECTED OFF-SITE IMPROVEMENTS (ACTON)**

MAP PARCEL(S)	OWNER/MAILING ADDRESS
B-4 2	NAGOG PARK TREATMENT CORP. C/O NO. ACTON TREATMENT CORP. 500 GREAT ROAD ACTON, MA 01720
B-4 2-3, 6-1	KCILL BREN FUND V LP C/O NAGOG PARK TREATMENT CORP. P.O. BOX 10074 CARLSBAD, CA 92003
B-4 1	NAGOG DEVELOPMENT COMPANY 500 GREAT ROAD ACTON, MA 01720
B-5 3	JAMES O. FENTON 100 WESTFORD RD. ACTON, MA 01720

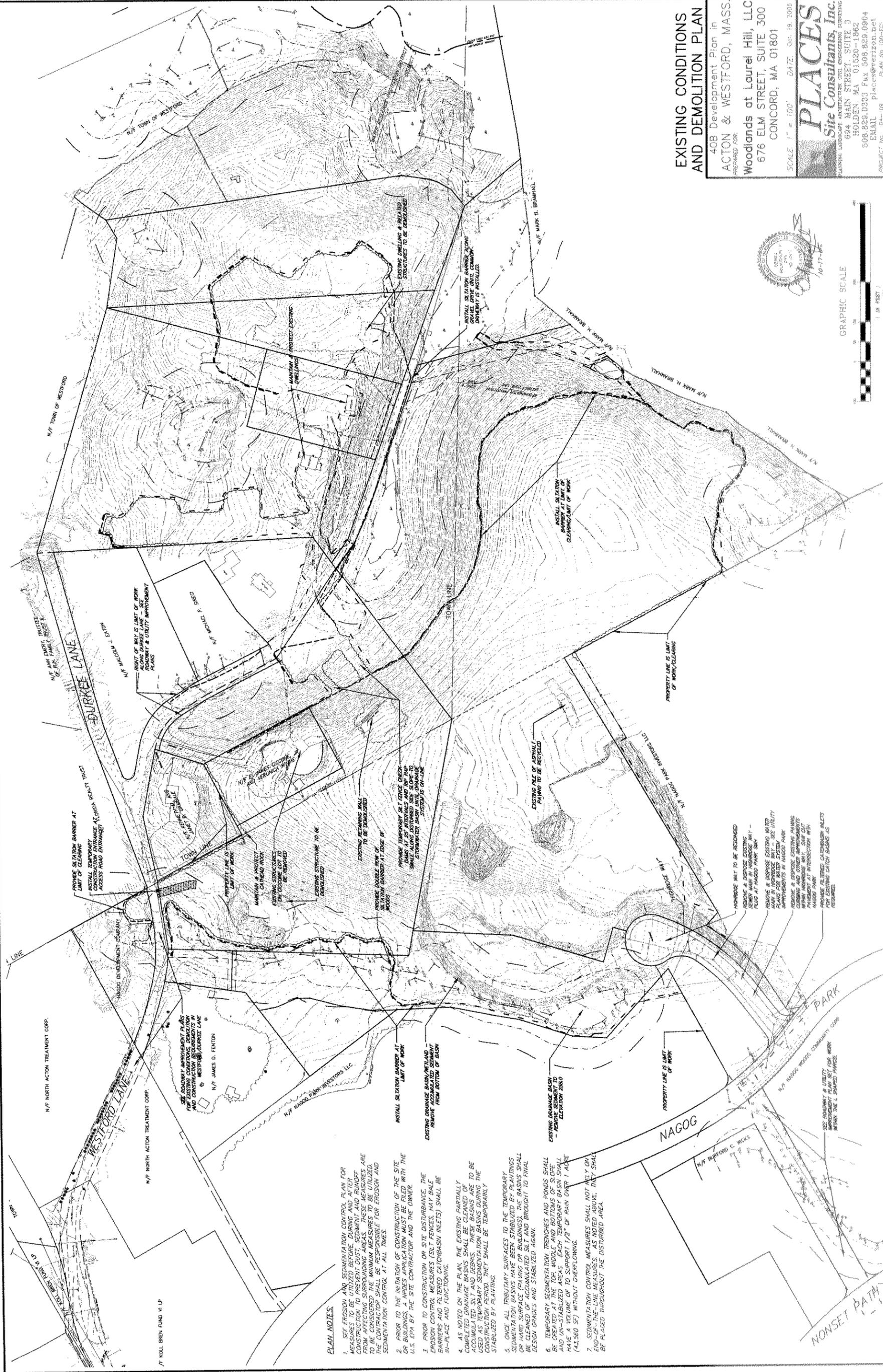
KEY TO PARCELS AFFECTED BY PROJECT

**EXISTING CONDITIONS  
AND DEMOLITION PLAN**

40B Development Plan in  
ACTON & WESTFORD, MASS.  
Prepared for:  
**Woodlands at Laurel Hill, LLC**  
676 ELM STREET, SUITE 300  
CONCORD, MA 01801

SCALE: 1" = 100' DATE: Dec. 19, 2005

**PLACES**  
Site Consultants, Inc.  
PLANNING, LANDSCAPE ARCHITECTURE, CIVIL ENGINEERING, SURVEYING  
594 MAIN STREET, SUITE 3  
HOLDEN, MA 01520-1862  
508.829.0333 Fax 508.829.0904  
EMAIL: places@verizon.net  
PROJECT No. DA-108 PLAN No. 100-EC



**PLAN NOTES:**

1. SEE EROSION AND SEDIMENTATION CONTROL PLAN FOR MEASURES TO BE UTILIZED BEFORE, DURING AND AFTER CONSTRUCTION TO PREVENT DUST, SEDIMENT AND RUNOFF FROM AFFECTING SURROUNDING AREAS. THESE MEASURES ARE TO BE CONSIDERED RESPONSIBLE FOR EROSION AND SEDIMENTATION CONTROL AT ALL TIMES.
2. PRIOR TO THE INITIATION OF CONSTRUCTION OF THE SITE OR BUILDINGS, A NPDES APPLICATION MUST BE FILED WITH THE U.S. EPA BY THE SITE CONTRACTOR AND THE OWNER.
3. PRIOR TO CONSTRUCTION OR SITE DISTURBANCE, THE EROSION CONTROL MEASURES (SILT FENCES, HAY BALE BARRIERS AND FILTERED CATCH-BASIN INLETS) SHALL BE IN-PLACE AND FUNCTIONING.
4. AS NOTED ON THE PLAN, THE EXISTING PARTIALLY DAMAGED CATCH BASIN SHALL BE CLEANED OF ACCUMULATED SILT AND DEBRIS. THESE BASINS ARE TO BE USED AS TEMPORARY SEDIMENTATION BASINS DURING THE CONSTRUCTION PERIOD. THEY SHALL BE TEMPORARILY STABILIZED BY PLANTING.
5. ONCE ALL TRIBUTARY SURFACES TO THE TEMPORARY SEDIMENTATION BASINS HAVE BEEN STABILIZED BY PLANTINGS OR HARD SURFACE (PAVING OR BUILDINGS), THE BASINS SHALL BE CLEANED OF ACCUMULATED SILT AND BROUGHT TO FINAL DESIGN GRADES AND STABILIZED AGAIN.
6. TEMPORARY SEDIMENTATION TRENCHES AND PONDS SHALL BE CLEANED AT THE TOP, MIDDLE AND BOTTOMS OF SLOPE AND UN-STABILIZED AREAS. EACH TEMPORARY BASIN SHALL HAVE A VOLUME OF TO SUPPORT 1/2" OF RAIN OVER 1 ACRE (43,560 SF) WITHOUT OVERTFLOWING.
7. SEDIMENTATION CONTROL MEASURES SHALL NOT BEY ON END-OF-CONSTRUCTION. CHECKS MUST BE MADE ABOVE. THEY SHALL BE PLACED THROUGHOUT THE DISTURBED AREA.

HIGHWAYWAY TO BE RECONSTRUCTED  
REMOVE & DISPOSE EXISTING  
SEWER MAIN IN HIGHWAYWAY -  
FLAG AT NAGOG PARK SWP  
REMOVE & DISPOSE EXISTING BRICK  
PAVEMENT IN HIGHWAYWAY. SEE UTILITY  
APPROPRIATIONS IN NAGOG PARK  
REMOVE & DISPOSE EXISTING PARKING  
CURBS AND OTHER IMPROVEMENTS  
PHASED AT INTERSECTION WITH  
NAGOG PARK  
PROVIDE FILTERED CATCH-BASIN INLETS  
WITH SLOPED CATCH BASINS AS  
REQUIRED.

N/F NORTH ACTION TREATMENT CORP.

N/F KOLL BREN FUND V. LP

N/F TOWN OF WESTFORD

N/F NORTH ACTION TREATMENT CORP.

N/F JAMES D. FENTON

N/F TOWN OF WESTFORD

N/F NAGOG PARK INVESTORS LLC

N/F MARK H. BRIMHALL

N/F TOWN OF WESTFORD

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THE WOODLANDS AT LAUREL HILL  
 COMPREHENSIVE PERMIT  
 ACTON & WESTFORD  
 MASSACHUSETTS  
 (MIDDLESEX COUNTY)

RECORD PLAN  
 FOR: WOODLANDS AT LAUREL HILL, LLC  
 SCALE: 1"=40' OCTOBER 19, 2005

STAMSKI AND MCNARY, INC.  
 80 HARRIS STREET ACTON, MASSACHUSETTS  
 ENGINEERING - PLANNING - SURVEYING  
 REG. NO. 45373  
 SHEET 1 OF 6  
 (3221RECT1.dwg) DURKEE LANE SM-3221



SEE TOWN OF ACTON ZONING BOARD OF APPEALS COMPREHENSIVE PERMIT DECISION RECORDED WITH MIDDLESEX SOUTH DISTRICT REGISTRY OF DEEDS IN BOOK \_\_\_\_\_ PAGE \_\_\_\_\_

APPROVED BY:  
 TOWN OF ACTON  
 ZONING BOARD OF APPEALS

DATE \_\_\_\_\_

SEE TOWN OF WESTFORD ZONING BOARD OF APPEALS COMPREHENSIVE PERMIT DECISION RECORDED WITH MIDDLESEX NORTH DISTRICT REGISTRY OF DEEDS IN BOOK \_\_\_\_\_ PAGE \_\_\_\_\_

APPROVED BY:  
 TOWN OF WESTFORD  
 ZONING BOARD OF APPEALS

DATE \_\_\_\_\_

NOTE:  
 SEE SHEET 6 OF 6 FOR NOTES, RECORD OWNERS, ZONING DISTRICTS, REFERENCES AND LOCUS MAP.

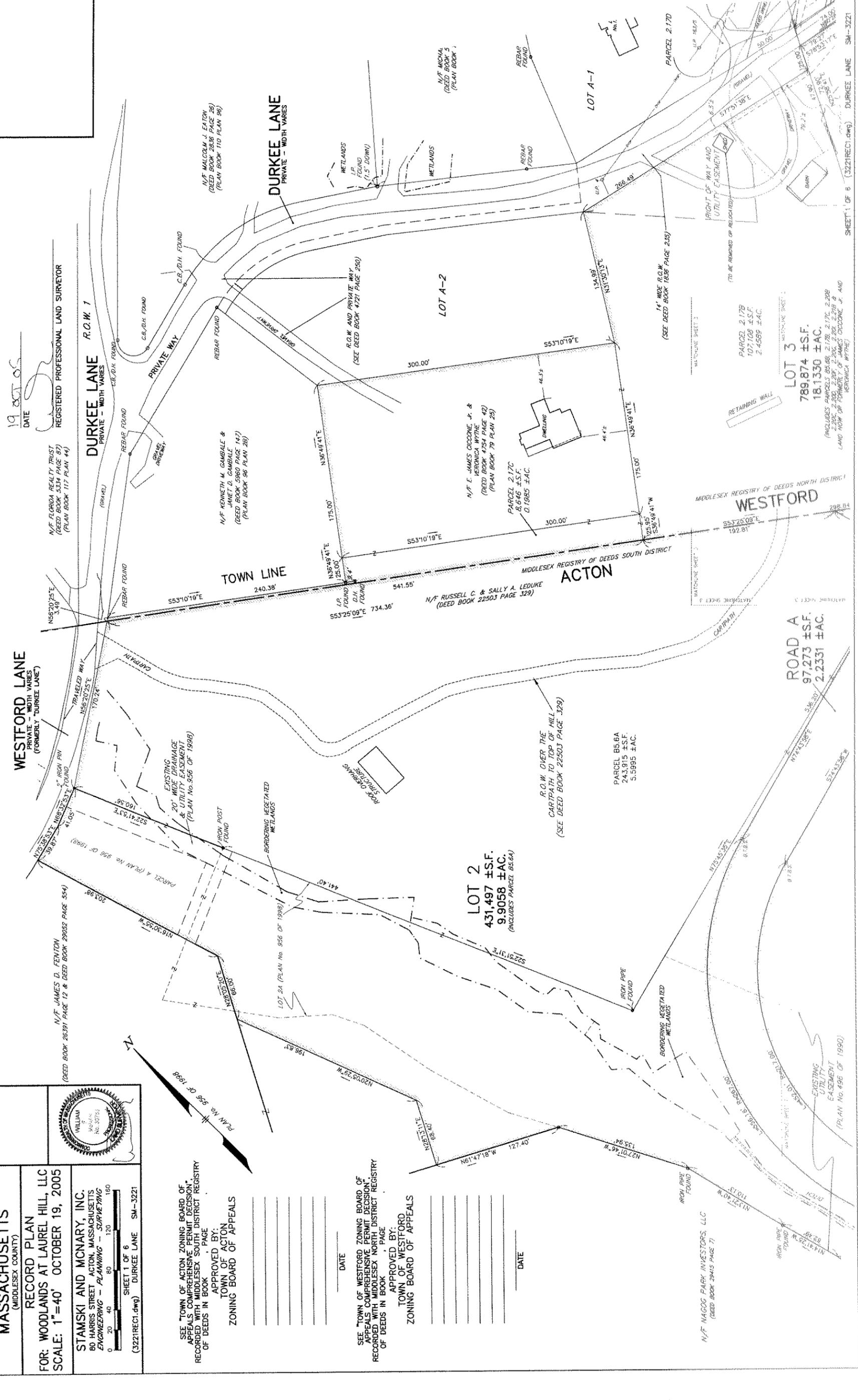
I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMITY WITH THE RULES AND REGULATIONS OF THE REGISTRARS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

19 2005  
 DATE  
 REGISTERED PROFESSIONAL LAND SURVEYOR

WESTFORD LANE  
 PRIVATE - WIDTH VARIES  
 (FORMERLY "DURKEE LANE")

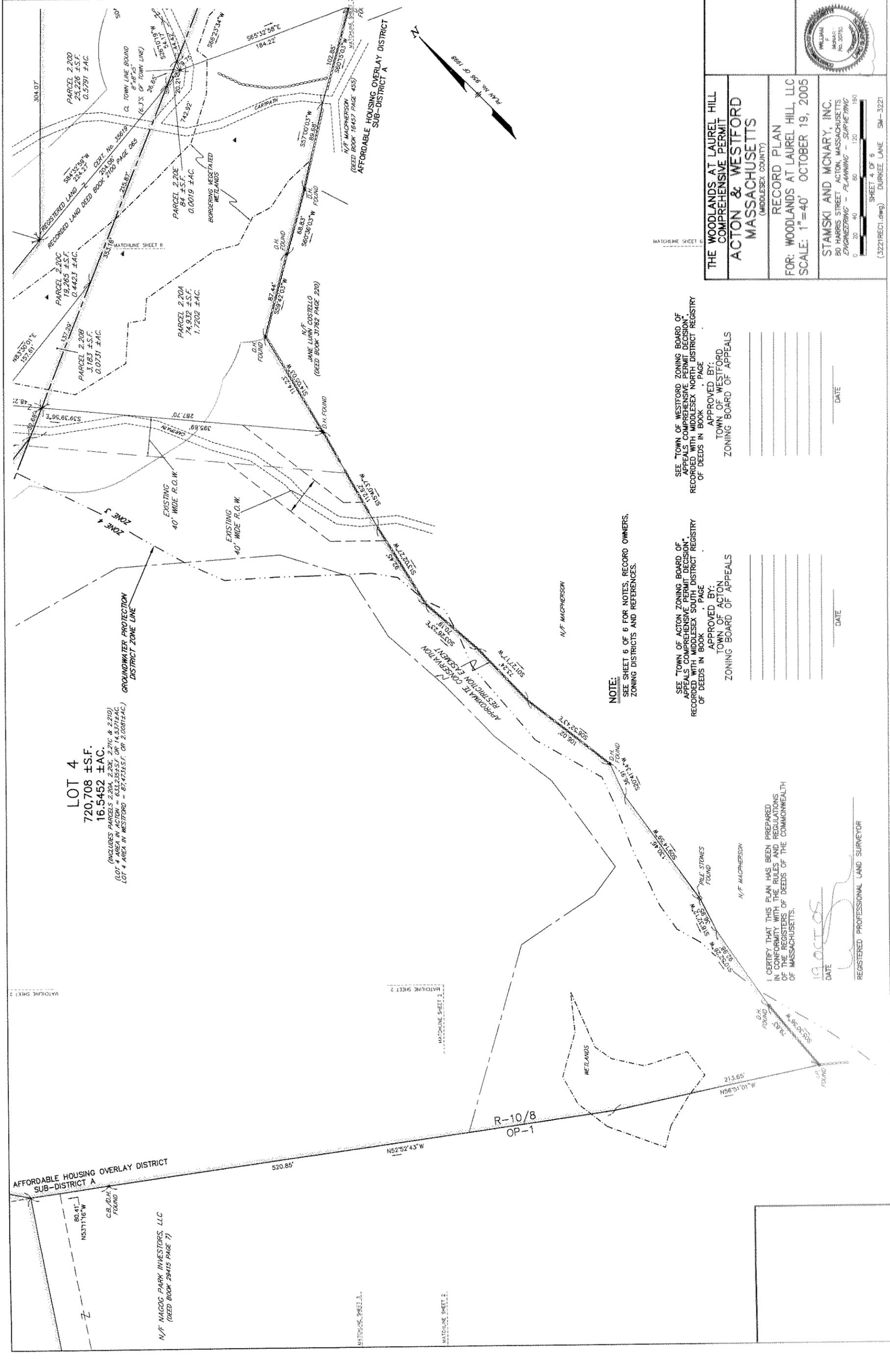
DURKEE LANE  
 PRIVATE - WIDTH VARIES  
 R.O.W. 1

DURKEE LANE  
 PRIVATE - WIDTH VARIES









**LOT 4**  
**720,708 ± S.F.**  
**16,5452 ± A.C.**  
 (INCLUDES PARCELS 2.200, 2.201, 2.202, 2.204 & 2.210)  
 (LOT 4 AREA IN ACTON = 831,205 ± S.F. OR 14,531 ± A.C.)  
 (LOT 4 AREA IN WESTFORD = 87,425 ± S.F. OR 2,066 ± A.C.)

N/F MAGOG PARK INVESTORS, LLC  
 (DEED BOOK 28415 PAGE 7)

**NOTE:**  
 SEE SHEET 5 OF 6 FOR NOTES, RECORD OWNERS,  
 ZONING DISTRICTS AND REFERENCES.

SEE TOWN OF ACTON ZONING BOARD OF  
 APPEALS COMPREHENSIVE PERMIT DECISION,  
 RECORDED WITH MIDDLESEX SOUTH DISTRICT REGISTRY  
 OF DEEDS IN BOOK . . . PAGE . . .

APPROVED BY:  
 TOWN OF ACTON  
 ZONING BOARD OF APPEALS

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED  
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 OF THE REGISTRARS OF DEEDS OF THE COMMONWEALTH  
 OF MASSACHUSETTS.

DATE: 10/19/05  
 REGISTERED PROFESSIONAL LAND SURVEYOR

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 OF DEEDS IN BOOK . . . PAGE . . .

APPROVED BY:  
 TOWN OF WESTFORD  
 ZONING BOARD OF APPEALS

DATE: \_\_\_\_\_

**THE WOODLANDS AT LAUREL HILL**  
**COMPREHENSIVE PERMIT**

**ACTON & WESTFORD**  
 MASSACHUSETTS  
 (MIDDLESEX COUNTY)

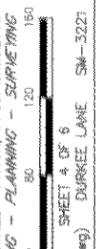
**RECORD PLAN**

**FOR: WOODLANDS AT LAUREL HILL, LLC**

**SCALE: 1"=40' OCTOBER 19, 2005**

STAMSKI AND MCNARY, INC.  
 80 HARRIS STREET, ACTON, MASSACHUSETTS  
 ENGINEERING - PLANNING - SURVEYING

SHEET 4 OF 6  
 (3221REC1.dwg) DURKEE LANE SM-3221



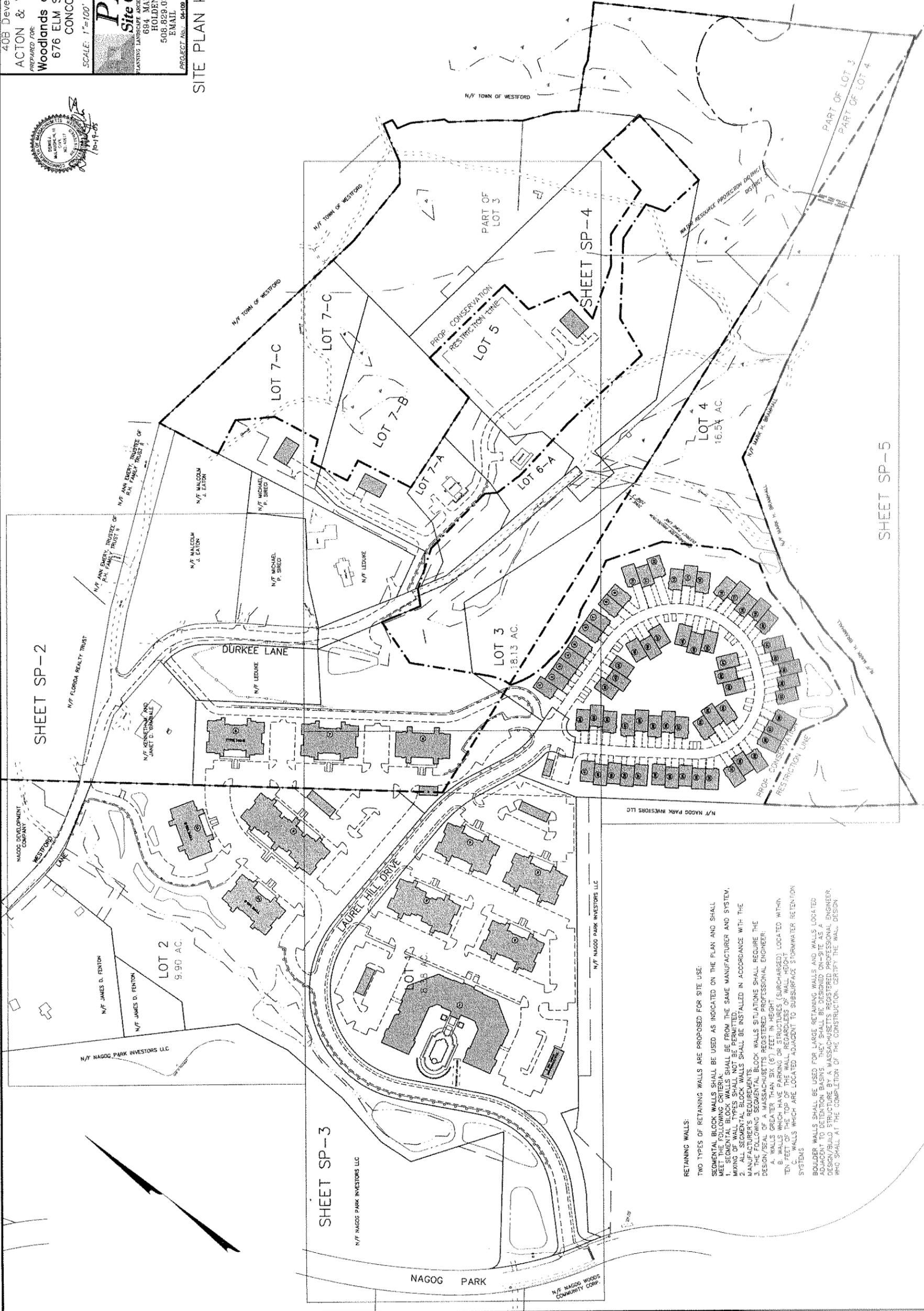




40B Development Plan in  
 ACTON & WESTFORD, MASS.  
 PREPARED FOR:  
**Woodlands at Laurel Hill, LLC**  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801

SCALE: 1"=100' DATE: October 18, 2005  
**PLACES**  
**Site Consultants, Inc.**  
 Site Consultants, Inc.  
 PLANNING, LANDSCAPE, ARCHITECTURE, CIVIL, ENGINEERING, SURVEYING  
 694 MAIN STREET, SUITE 3  
 HOLDEN, MA 01520-1862  
 508.829.0333 Fax 508.829.0904  
 EMAIL: places@verizon.net  
 PROJECT No.: 04-109 PLAN No.: 03-SP-1

SITE PLAN KEY SHEET



**RETAINING WALLS:**  
 TWO TYPES OF RETAINING WALLS ARE PROPOSED FOR SITE USE:  
 1. SEGMENTAL BLOCK WALLS SHALL BE USED AS INDICATED ON THE PLAN AND SHALL MEET THE FOLLOWING CRITERIA: SHALL BE FROM THE SAME MANUFACTURER AND SYSTEM, SHALL BE CONSTRUCTED BY THE SAME CONTRACTOR, SHALL NOT BE PERMITTED TO MIXING OF WALL TYPES SHALL NOT BE PERMITTED.  
 2. ALL SEGMENTAL BLOCK WALLS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.  
 3. THE FOLLOWING SEGMENTAL BLOCK WALLS SITUATIONS SHALL REQUIRE THE DESIGN/SEAL OF A MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER:  
 A. WALLS GREATER THAN SIX (6) FEET IN HEIGHT (SURCHARGED) LOCATED WITHIN TEN FEET OF ANY PARKING OR STRUCTURES.  
 B. WALLS WHICH ARE LOCATED ADJACENT TO SUBSURFACE STORMWATER RETENTION SYSTEMS.  
 C. WALLS WHICH ARE LOCATED ADJACENT TO SUBSURFACE STORMWATER RETENTION SYSTEMS.  
 BOULDER WALLS SHALL BE USED FOR LARGE RETAINING WALLS AND WALLS LOCATED ADJACENT TO DETENTION BASINS. THEY SHALL BE DESIGNED ON-SITE AS A DESIGN/SEAL STRUCTURE BY A MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER, WHO SHALL AT THE COMPLETION OF THE CONSTRUCTION, CERTIFY THE WALLS.

N/F KENNEDY LAND CORP.  
 FORMERLY BOSTON AND MAINE R.R.  
 NASHUA & ACTON R.R.

SHEET SP-5

SHEET SP-3

SHEET SP-4

SHEET SP-2

N/F NAGOG PARK INVESTORS LLC

N/F NAGOG PARK INVESTORS LLC

N/F NAGOG PARK INVESTORS LLC

NAGOG PARK

N/F NAGOG WOODS COMMUNITY CORP.

N/F FLORIDA REALTY TRUST

N/F ANNE EMERY, TRUSTEE OF R.M. FAMILY TRUST II

N/F MALCOLM J. EATON

N/F MICHAEL P. SIREC

N/F LEDUKE

LOT 3  
18.13 AC.

LOT 4  
16.54 AC.

LOT 7-C

LOT 7-B

LOT 7-A

LOT 6-A

PART OF LOT 3

PART OF LOT 3  
 PART OF LOT 4

N/F TOWN OF WESTFORD

N/F TOWN OF WESTFORD

DURKEE LANE

LAUREL HILL DRIVE

N/F MARK A. BRUNNEN

THORNTON H. WOOD JR.

N/WATER RESOURCE PROTECTION DISTRICT DISTRICT

N/F TOWN OF WESTFORD

NAGOG DEVELOPMENT COMPANY

N/F JAMES D. FENYON

N/F JAMES D. FENYON

LOT 2  
9.90 AC.

N/F KENNETH AND JANET D. SINIBALE

N/F MALCOLM J. EATON

N/F MICHAEL P. SIREC

N/F LEDUKE

LOT 3  
18.13 AC.

LOT 4  
16.54 AC.

LOT 7-C

LOT 7-B

LOT 7-A

LOT 6-A

PART OF LOT 3

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 PART OF LOT 4

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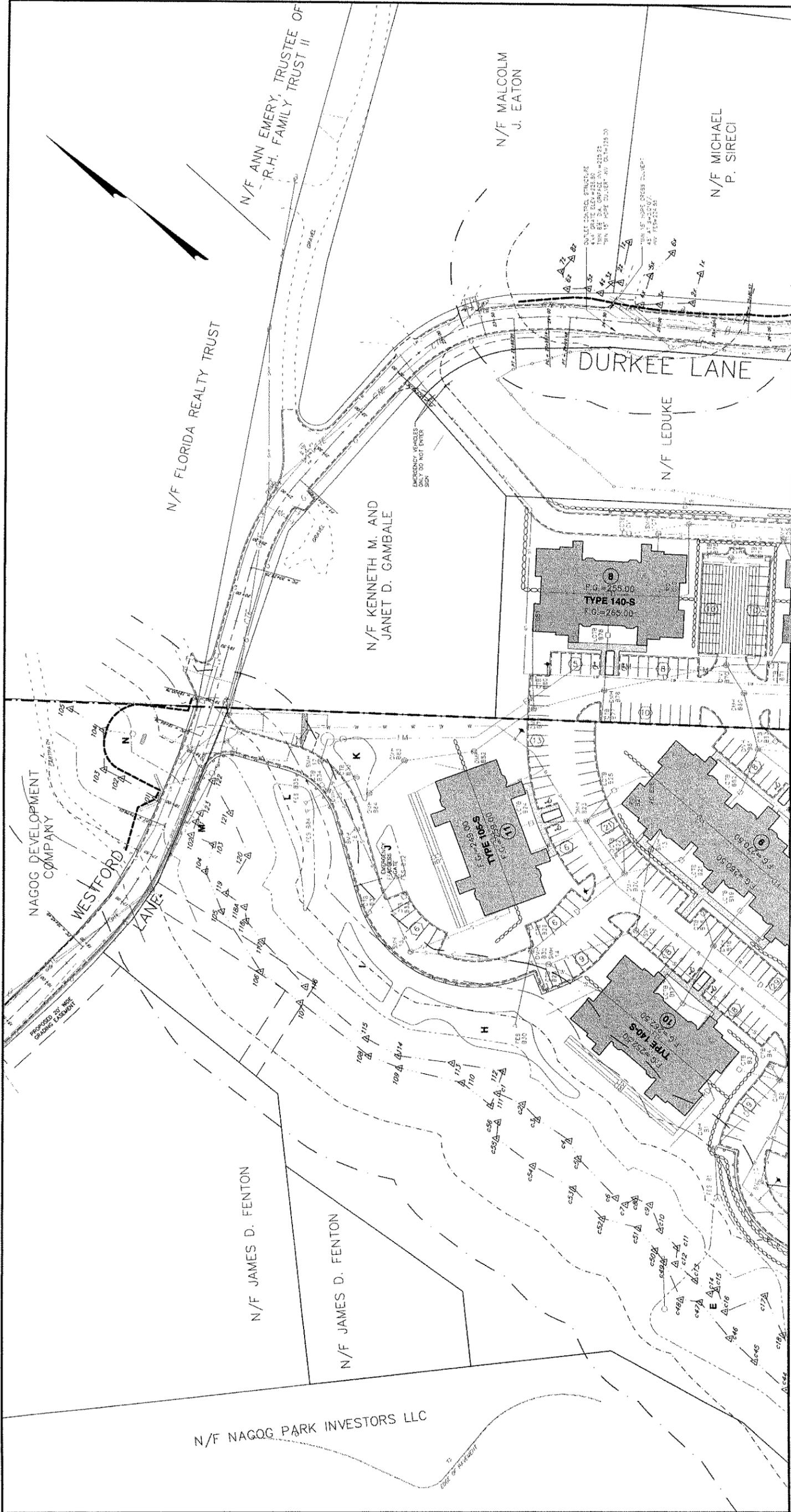
LOT 2  
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N/F MICHAEL P. SIREC

N/F LEDUKE



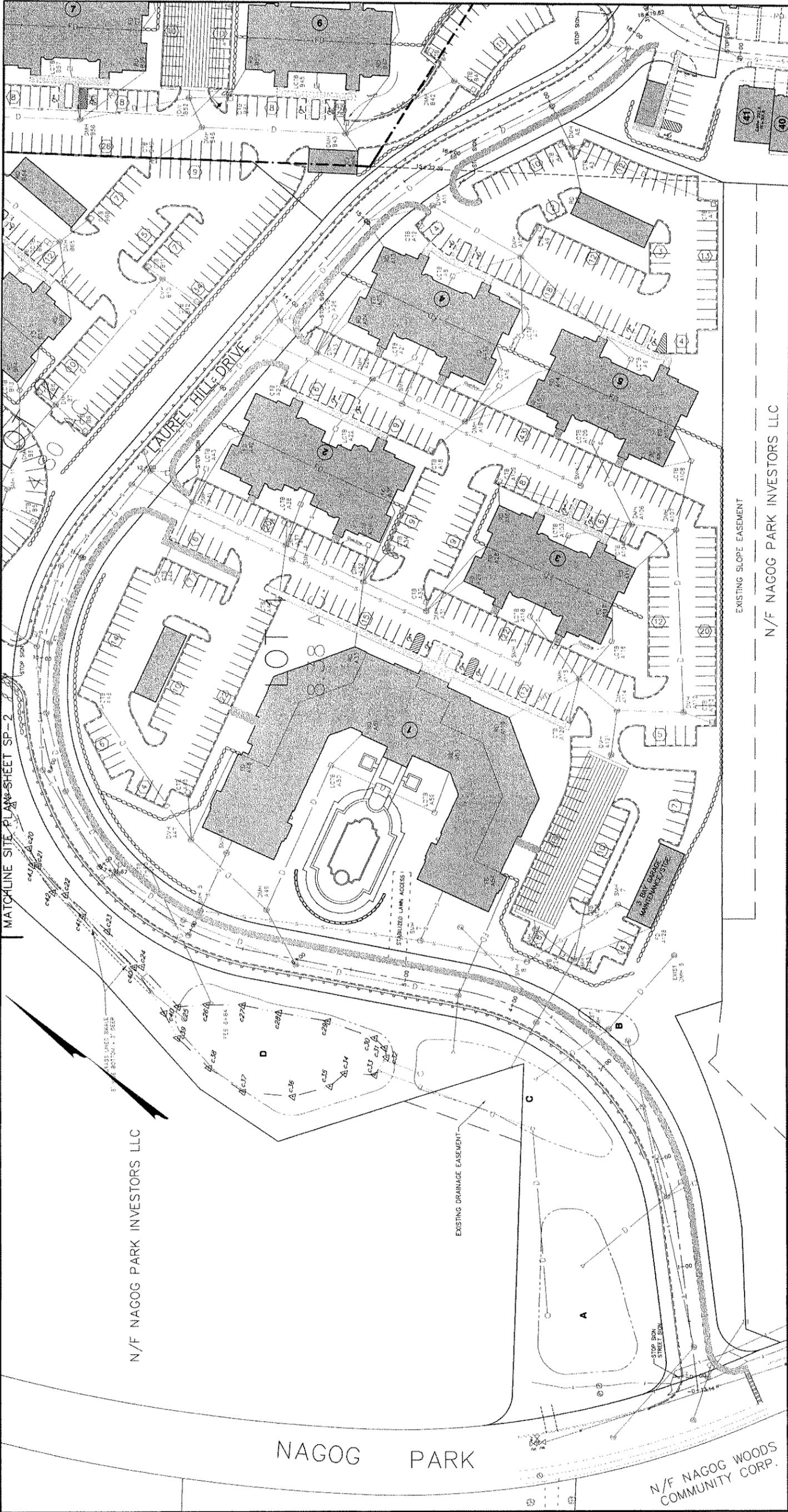
40B Development Plan in  
 ACTON & WESTFORD, MASS.  
 PREPARED FOR:  
**Woodlands at Laurel Hill, LLC**  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801

SCALE: 1"=40'  
 DATE: October 15, 2006

**PLACES**  
 Site Consultants, Inc.  
 JUNIOR UNIVERSITY ARCHITECTURE, CIVIL, STRUCTURAL, SURVEYING  
 694 MAIN STREET, SUITE 3  
 HOLDEN, MA 01520-1862  
 508.829.0333 Fax 508.829.0804  
 EMAIL: places@verizon.net  
 PROJECT No. 06-108 PL. No. 06-108-S-2

MATCHLINE SITE PLAN SHEET SP-3

MATCHLINE SITE PLAN SHEET SP-4



N/F NAGOG PARK INVESTORS LLC

NAGOG PARK

N/F NAGOG WOODS COMMUNITY CORP.

40B Development Plan in  
 ACTION & WESTFORD, MASS.  
 PREPARED FOR:  
**Woodlands at Laurel Hill, LLC**  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801

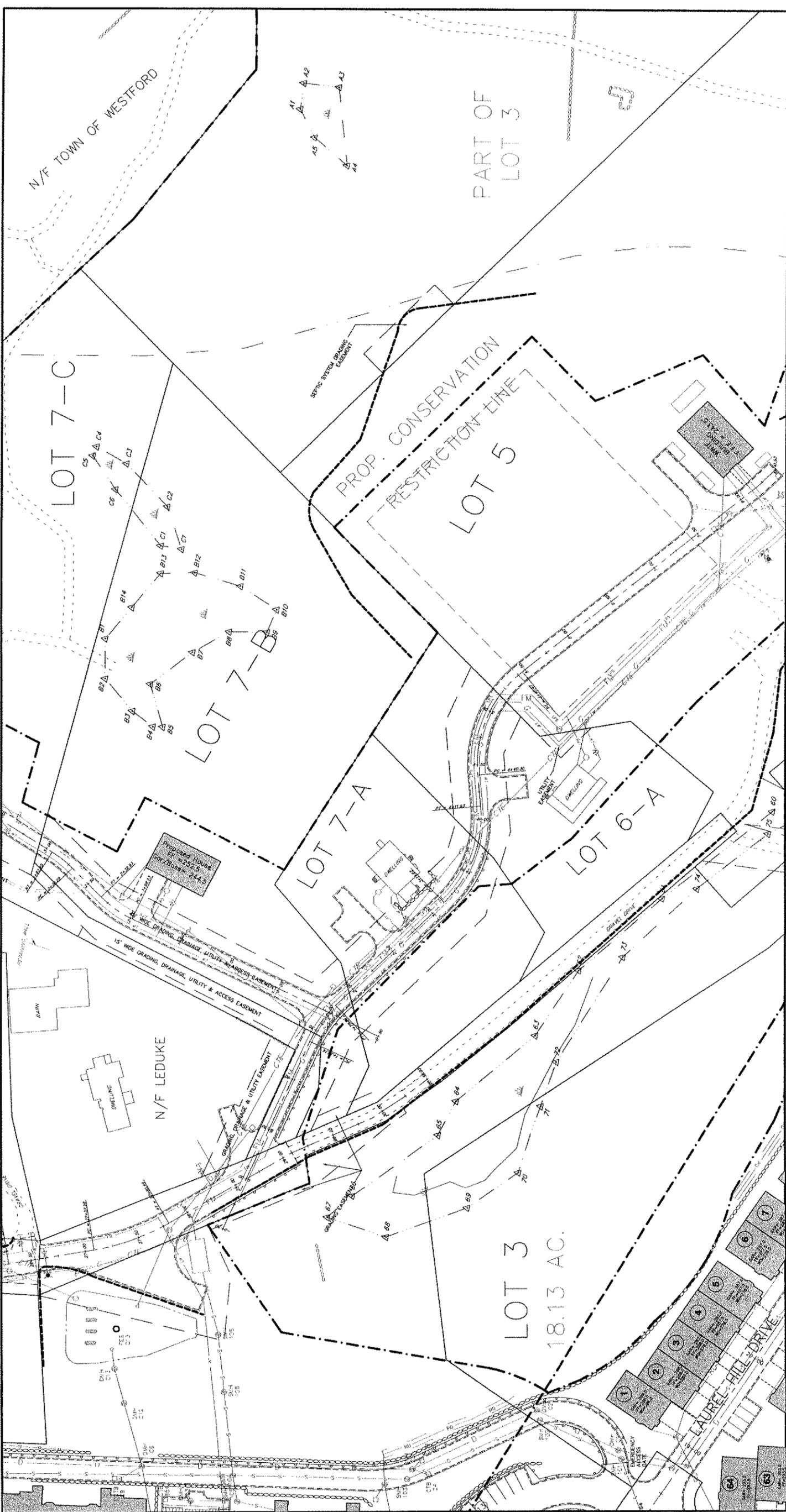
SCALE: 1"=40' DATE: October 18, 2005

**PLACES**  
 Site Consultants, Inc.  
 PLANNING CONSULTANTS ARCHITECTURE CIVIL ENGINEERING SURVEYING  
 694 MAIN STREET, SUITE 3  
 HOLDEN, MA 01520-1862  
 508.829.0333 Fax 508.829.0904  
 EMAIL: places@verizon.net  
 PROJECT No. 04-008 PLAN No. 000-003

MATCHLINE  
 SHEET SP-5

N/F NAGOG PARK INVESTORS LLC





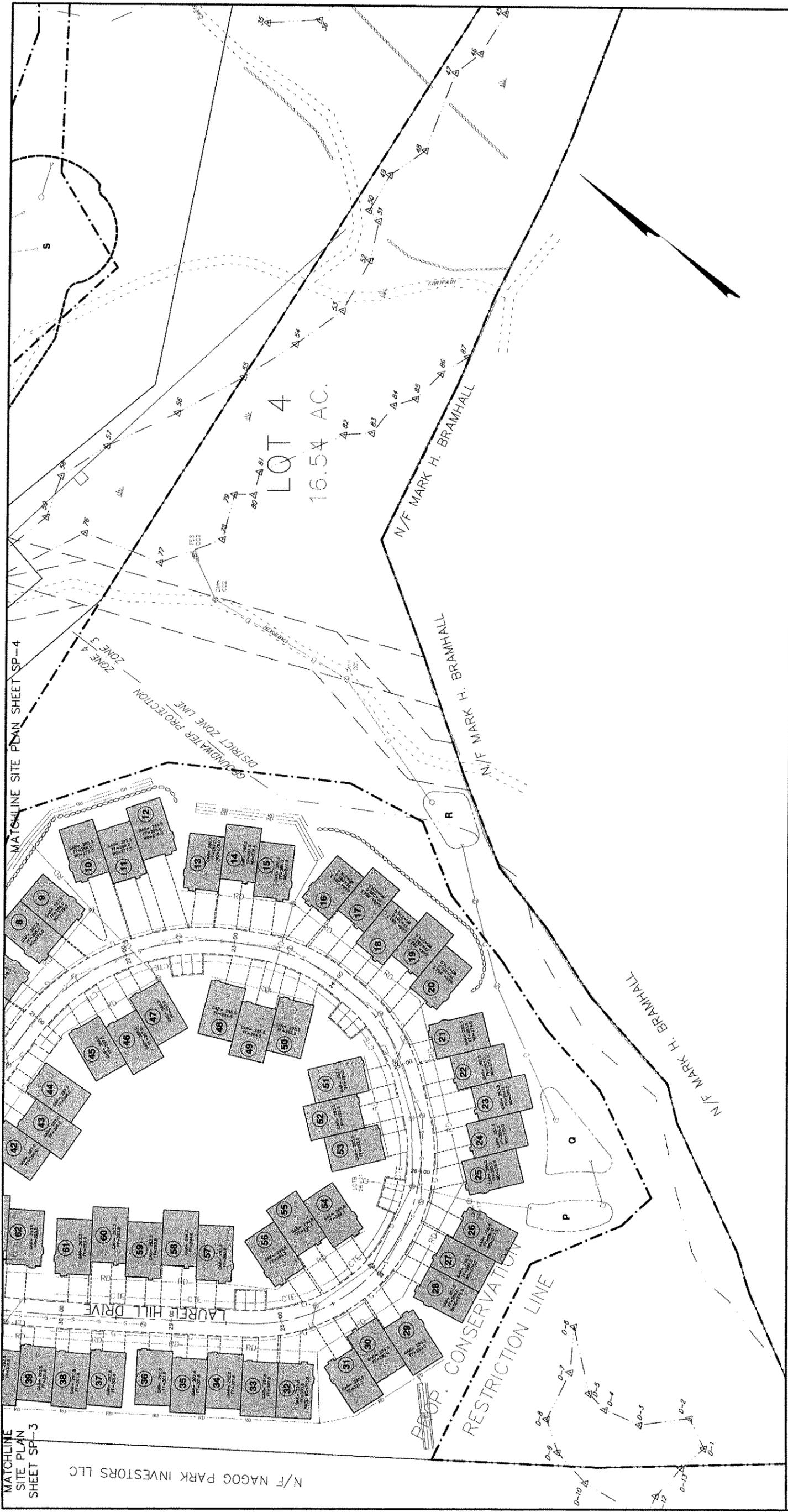
MATCHLINE SITE PLAN SHEET SP-5

405 Development Plan in  
 ACTION & WESTFORD, MASS  
 PREPARED FOR  
**Woodlands at Laurel Hill, LLC**  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801

SCALE: 1"=40' DATE: October 18, 2005

**PLACES**  
*Site Consultants, Inc.*  
 PLANNING, LANDSCAPE ARCHITECTURE, CIVIL ENGINEERING, SURVEYING  
 694 MAIN STREET, SUITE 3  
 HOLDEN, MA 01528-1862  
 508.829.8333 Fax 508.829.8904  
 EMAIL: places@verizon.net  
 REG. NO. 04-198 PLAN No. 0508-04



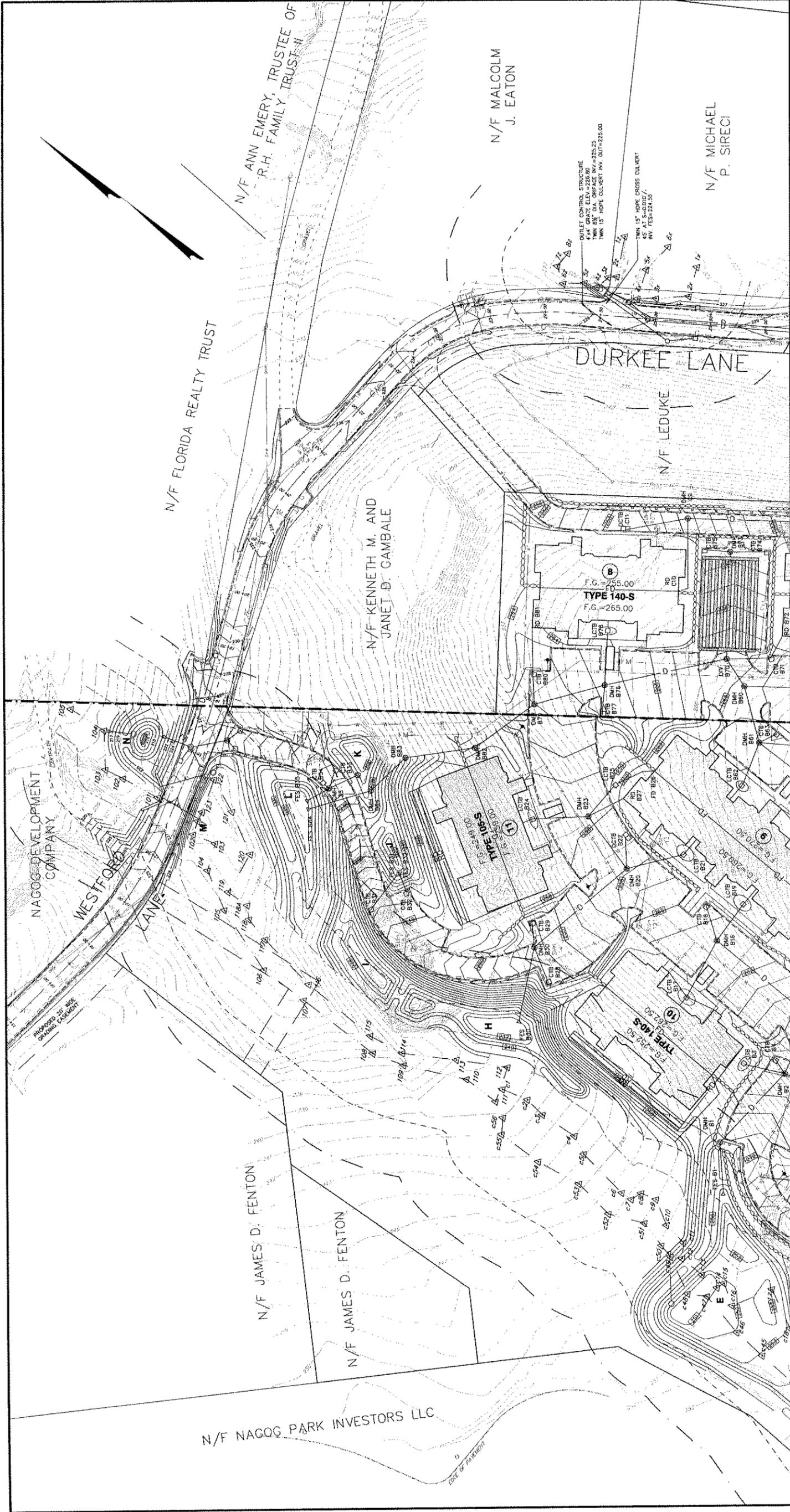


40B Development Plan in  
 ACTON & WESTFORD, MASS.  
 PREPARED FOR  
 Woodlands at Laurel Hill, LLC  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801

SCALE: 1"=40' DATE: October 18, 2006

**PLACES**  
 Site Consultants, Inc.  
 PLANNING LANDSCAPE ARCHITECTURE CIVIL ENGINEERING SURVEYING  
 834 MAIN STREET SUITE 3  
 HOLBEN, MA 01520-1852  
 508.829.0833 Fax 508.829.0904  
 EMAIL: places@verizon.net  
 PROJECT No. 06-108 PLAN No. 108-SP-4





40B Development Plan in  
 ACTION & WESTFORD, MASS.  
 PREPARED FOR:  
**Woodlands at Laurel Hill, LLC**  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801

SCALE: 1" = 40'  
 DATE: October 18, 2005

**PLACES**  
 Site Consultants, Inc.  
 694 MAIN STREET, SUITE 3  
 HOLDEN, MA 01520-1862  
 508.829.0333 Fax 508.829.0904  
 EMAIL: places@verizon.net

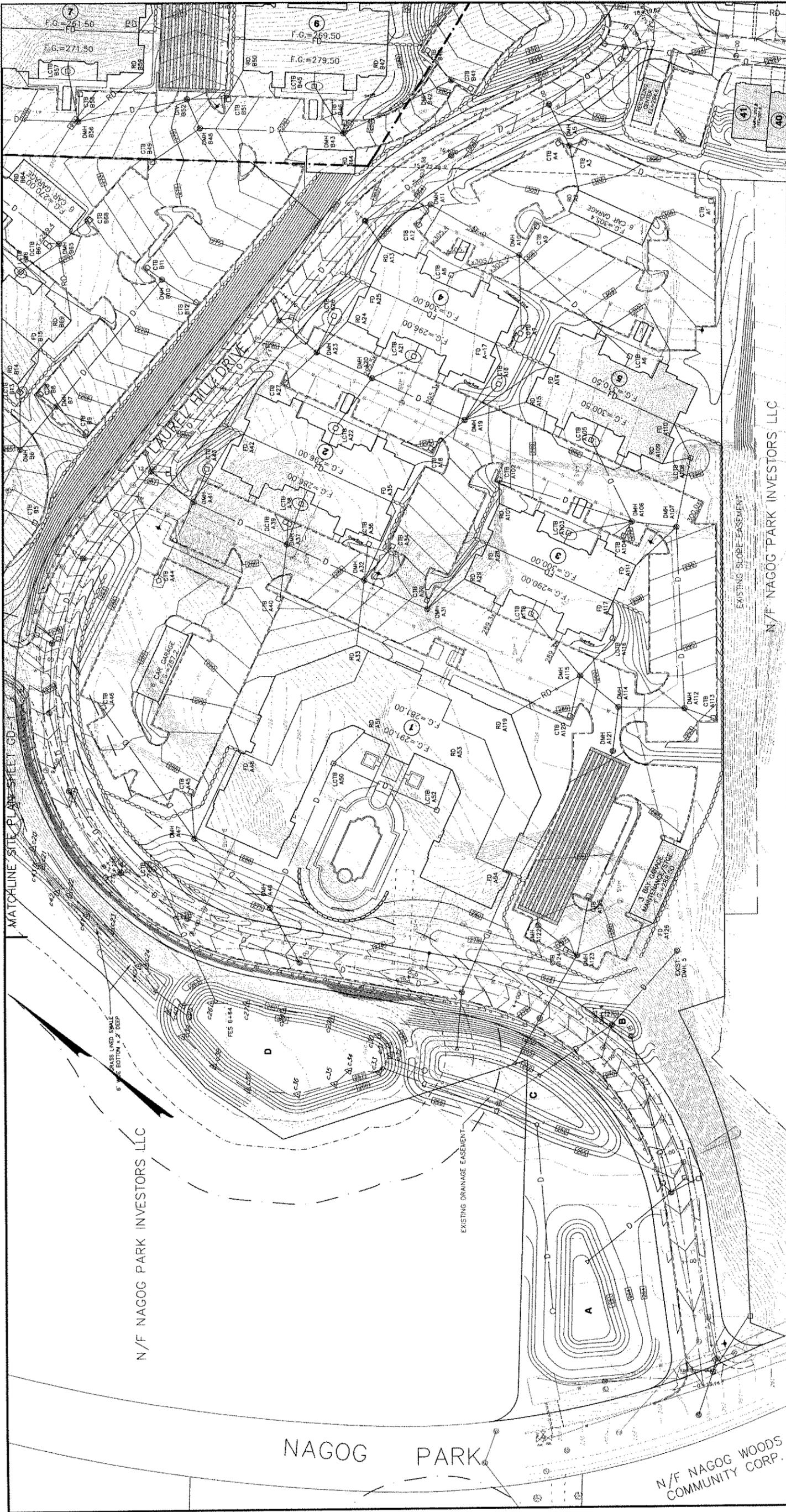
PLAC No. 100-28-1



MATCHLINE SITE PLAN SHEET GD-2

MATCHLINE SITE PLAN SHEET GD-3

NOTES:  
 1. SEE DEMOLITION PLANS FOR REMOVAL OF EXISTING HIGH RIDGE ROAD STRUCTURES.  
 2. SEE GRADING AND DRAINAGE PLAN (SHEET 100-GD-5 FOR ALL DRAINAGE LINE AND OUTLET DATA.  
 3. SEE UTILITY PLANS (SHEETS 100-UT-1 THRU 4) FOR ALL SEWER LINE DATA.



MATCHLINE SITE PLAN SHEET GD-1

N/F NAGOG PARK INVESTORS LLC

NAGOG PARK

N/F NAGOG WOODS COMMUNITY CORP.

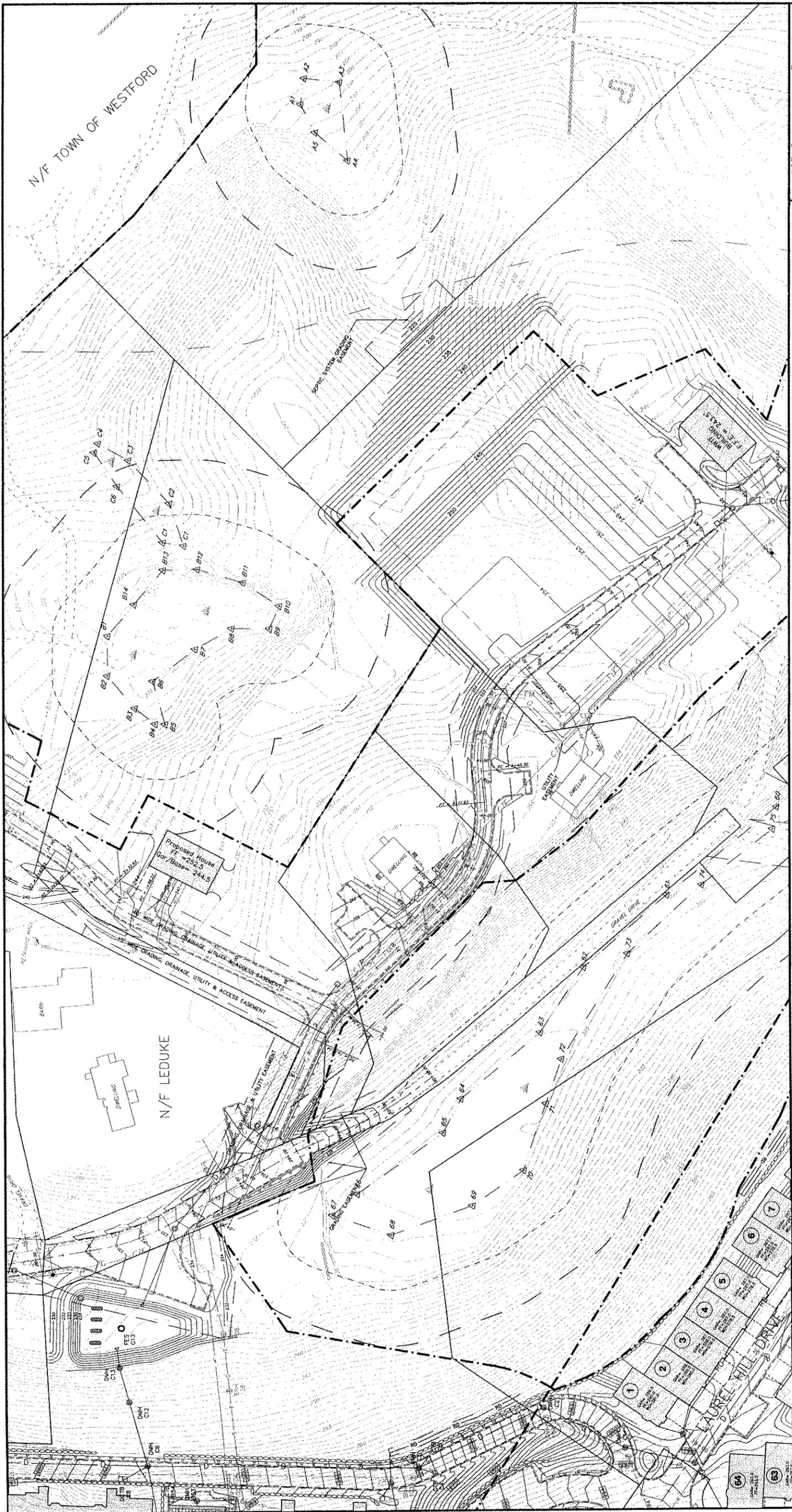
40B Development Plan in  
 ACTION & WESTFORD, MASS.  
 PREPARED FOR:  
**Woodlands at Laurel Hill, LLC**  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801  
 SCALE: 1"=40'  
 DATE: October 19, 2005



**PLACES**  
 Site Consultants, Inc.  
 LICENSED LANDSCAPE ARCHITECTURE CONSULTING ENGINEERING SURVEYING  
 694 MAIN STREET, SUITE 3  
 HOLDEY, MA 01520-1862  
 508.629.6333 Fax 508.629.6904  
 EMAIL: Places@verizon.net  
 PROJECT No. 04-08

MATCHLINE  
 SITE PLAN SHEET GD-4

- NOTES:
1. SEE DEMOLITION PLANS FOR REMOVAL OF EXISTING HIGH-RISE ROADS STRUCTURES PLAN (SHEET GD-1).
  2. SEE PLANS FOR AN EXISTING DRAINAGE LINE AND OUTLET DATA.
  3. SEE UTILITY PLANS (SHEETS 100-UP thru 4) FOR ALL SERVICE LINE DATA.



40B Development Plan in  
 ACTON & WESTFORD, MASS.  
 PREPARED FOR  
 Woodlands at Laurel Hill, LLC  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801

SCALE: 1"=40'  
 DATE: October 19, 2005

**PLACES**  
 Site Consultants, Inc.  
 PLACING LANDSCAPE ARCHITECTURE CIVIL ENGINEERING SURVEYING  
 694 MAIN STREET, SUITE 3  
 HOLDEN, MA 01520-1862  
 508.829.0333 Fax 508.829.0904  
 EMAIL: places@verizon.net  
 PROJECT No. 04-028 PLAN No. 000-003



MATCHLINE SITE PLAN SHEET GO-4

- NOTES:
1. SEE DEMOLITION PLANS FOR REMOVAL OF EXISTING HOUSE, POOL, AND STRUCTURES.
  2. SEE GRADING AND DRAINAGE PLAN (SHEET 100-GO-5) FOR ALL DRAINAGE LINE AND OUTLET DATA.
  3. SEE UTILITY PLANS (SHEETS 100-UP, 100-UP-4) FOR ALL SEWER LINE DATA.





MATCHLINE  
SITE PLAN  
SHEET GD-2  
N/F NAGOG PARK INVESTORS LLC

MATCHLINE SITE PLAN SHEET GD-3

40B Development Plan in  
ACTON & WESTFORD, MASS  
Prepared for:  
Woodlands at Laurel Hill, LLC  
676 ELM STREET, SUITE 300  
CONCORD, MA 01801  
SCALE: 1"=40'  
DATE: October 19, 2005  
PROJECT No. 04-108



**PLACES**  
Site Consultants, Inc.  
694 MAIN STREET, SUITE 3  
HOLDEN, MA 01520-1962  
606.629.0333 Fax 506.629.0904  
EMAIL: places@verizon.net

- NOTES:
1. SEE DEMOLITION PLANS FOR REMOVAL OF EXISTING HIGH RIDGE ROAD STRUCTURES.
  2. SEE GRADING AND DRAINAGE PLAN (SHEET 100-1) FOR EXISTING AND PROPOSED DRAINAGE AND GUTTER DATA.
  3. SEE EROSION CONTROL PLAN (SHEET 100-2) FOR ALL SEWER LINE DATA.

Description	Pipe Data				Vertical Control	
	Inlet Structure	Outlet Structure	Length (ft)	Slope (ft/ft)	Invert Elevation	Rim/Surface Elevation @ Inlet
DMH A1	DMH A5	DMH A5	19	0.020	12	264.00
DMH A2	DMH A5	DMH A5	44	0.010	6	267.40
DMH A3	DMH A5	DMH A5	13	0.008	12	267.80
DMH A4	DMH A5	DMH A5	10	0.010	12	268.10
DMH A5	DMH A5	DMH A5	42	0.030	12	268.50
DMH A6	DMH A5	DMH A5	10	0.010	12	268.90
DMH A7	DMH A5	DMH A5	10	0.005	15	269.30
DMH A8	DMH A5	DMH A5	98	0.025	15	269.70
DMH A9	DMH A5	DMH A5	8	0.030	6	270.10
DMH A10	DMH A5	DMH A5	72	0.050	6	270.50
DMH A11	DMH A5	DMH A5	64	0.050	6	270.90
DMH A12	DMH A5	DMH A5	81	0.050	12	271.30
DMH A13	DMH A5	DMH A5	31	0.050	12	271.70
DMH A14	DMH A5	DMH A5	8	0.074	6	272.10
DMH A15	DMH A5	DMH A5	68	0.074	6	272.50
DMH A16	DMH A5	DMH A5	43	0.010	12	272.90
DMH A17	DMH A5	DMH A5	80	0.010	12	273.30
DMH A18	DMH A5	DMH A5	41	0.010	12	273.70
DMH A19	DMH A5	DMH A5	8	0.010	12	274.10
DMH A20	DMH A5	DMH A5	92	0.010	12	274.50
DMH A21	DMH A5	DMH A5	41	0.010	12	274.90
DMH A22	DMH A5	DMH A5	54	0.010	12	275.30
DMH A23	DMH A5	DMH A5	56	0.010	12	275.70
DMH A24	DMH A5	DMH A5	40	0.020	6	276.10
DMH A25	DMH A5	DMH A5	76	0.024	6	276.50
DMH A26	DMH A5	DMH A5	36	0.010	6	276.90
DMH A27	DMH A5	DMH A5	96	0.010	6	277.30

Description	Pipe Data				Vertical Control	
	Inlet Structure	Outlet Structure	Length (ft)	Slope (ft/ft)	Invert Elevation	Rim/Surface Elevation @ Inlet
DMH B1	DMH B1	DMH B1	46	0.020	18	264.45
DMH B2	DMH B1	DMH B1	66	0.005	18	264.85
DMH B3	DMH B2	DMH B2	36	0.005	6	265.25
DMH B4	DMH B2	DMH B2	41	0.010	12	265.65
DMH B5	DMH B2	DMH B2	56	0.005	15	266.05
DMH B6	DMH B2	DMH B2	51	0.010	12	266.45
DMH B7	DMH B2	DMH B2	37	0.010	12	266.85
DMH B8	DMH B2	DMH B2	18	0.021	12	267.25
DMH B9	DMH B2	DMH B2	150	0.006	12	267.65
DMH B10	DMH B2	DMH B2	38	0.010	12	268.05
DMH B11	DMH B2	DMH B2	53	0.005	12	268.45
DMH B12	DMH B2	DMH B2	43	0.010	6	268.85
DMH B13	DMH B2	DMH B2	11	0.005	12	269.25
DMH B14	DMH B2	DMH B2	58	0.010	6	269.65
DMH B15	DMH B2	DMH B2	33	0.010	12	270.05
DMH B16	DMH B2	DMH B2	40	0.005	8	270.45
DMH B17	DMH B2	DMH B2	53	0.006	6	270.85
DMH B18	DMH B2	DMH B2	26	0.005	12	271.25
DMH B19	DMH B2	DMH B2	59	0.020	12	271.65
DMH B20	DMH B2	DMH B2	50	0.005	8	272.05
DMH B21	DMH B2	DMH B2	36	0.005	6	272.45
DMH B22	DMH B2	DMH B2	36	0.005	6	272.85
DMH B23	DMH B2	DMH B2	36	0.005	6	273.25
DMH B24	DMH B2	DMH B2	36	0.005	6	273.65
DMH B25	DMH B2	DMH B2	36	0.005	6	274.05
DMH B26	DMH B2	DMH B2	36	0.005	6	274.45
DMH B27	DMH B2	DMH B2	60	0.005	12	274.85
DMH B28	DMH B2	DMH B2	60	0.005	12	275.25
DMH B29	DMH B2	DMH B2	60	0.005	12	275.65
DMH B30	DMH B2	DMH B2	60	0.005	12	276.05

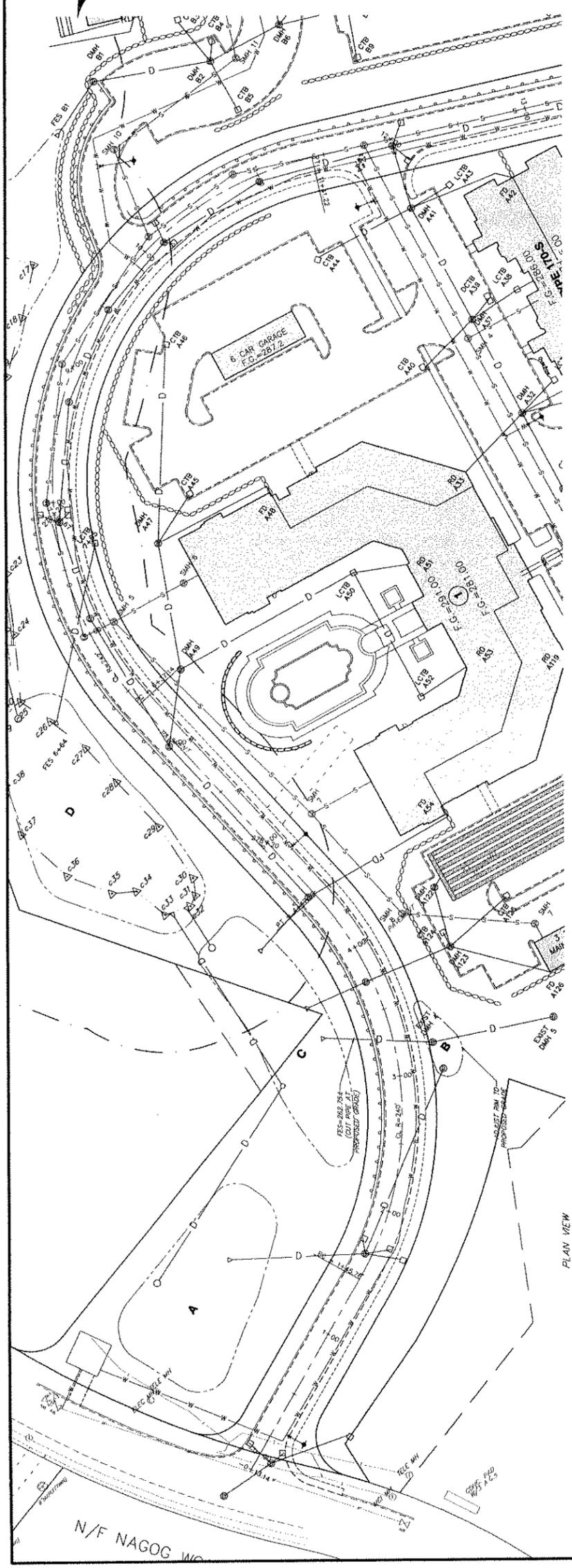
Description	Pipe Data				Vertical Control	
	Inlet Structure	Outlet Structure	Length (ft)	Slope (ft/ft)	Invert Elevation	Rim/Surface Elevation @ Inlet
DMH C1	DMH C1	DMH C1	34	0.010	6	268.44
DMH C2	DMH C1	DMH C1	45	0.010	12	268.84
DMH C3	DMH C1	DMH C1	45	0.010	12	269.24
DMH C4	DMH C1	DMH C1	45	0.010	12	269.64
DMH C5	DMH C1	DMH C1	45	0.010	12	270.04
DMH C6	DMH C1	DMH C1	45	0.010	12	270.44
DMH C7	DMH C1	DMH C1	45	0.010	12	270.84
DMH C8	DMH C1	DMH C1	45	0.010	12	271.24
DMH C9	DMH C1	DMH C1	45	0.010	12	271.64
DMH C10	DMH C1	DMH C1	45	0.010	12	272.04
DMH C11	DMH C1	DMH C1	45	0.010	12	272.44
DMH C12	DMH C1	DMH C1	45	0.010	12	272.84
DMH C13	DMH C1	DMH C1	45	0.010	12	273.24
DMH C14	DMH C1	DMH C1	45	0.010	12	273.64
DMH C15	DMH C1	DMH C1	45	0.010	12	274.04
DMH C16	DMH C1	DMH C1	45	0.010	12	274.44
DMH C17	DMH C1	DMH C1	45	0.010	12	274.84
DMH C18	DMH C1	DMH C1	45	0.010	12	275.24
DMH C19	DMH C1	DMH C1	45	0.010	12	275.64
DMH C20	DMH C1	DMH C1	45	0.010	12	276.04
DMH C21	DMH C1	DMH C1	45	0.010	12	276.44
DMH C22	DMH C1	DMH C1	45	0.010	12	276.84
DMH C23	DMH C1	DMH C1	45	0.010	12	277.24
DMH C24	DMH C1	DMH C1	45	0.010	12	277.64
DMH C25	DMH C1	DMH C1	45	0.010	12	278.04
DMH C26	DMH C1	DMH C1	45	0.010	12	278.44
DMH C27	DMH C1	DMH C1	45	0.010	12	278.84
DMH C28	DMH C1	DMH C1	45	0.010	12	279.24
DMH C29	DMH C1	DMH C1	45	0.010	12	279.64
DMH C30	DMH C1	DMH C1	45	0.010	12	280.04

Description	Pipe Data				Vertical Control	
	Inlet Structure	Outlet Structure	Length (ft)	Slope (ft/ft)	Invert Elevation	Rim/Surface Elevation @ Inlet
DMH D1	DMH D1	DMH D1	42	0.035	12	277.48
DMH D2	DMH D1	DMH D1	145	0.011	12	277.88
DMH D3	DMH D1	DMH D1	63	0.005	6	278.28
DMH D4	DMH D1	DMH D1	63	0.010	6	278.68
DMH D5	DMH D1	DMH D1	63	0.010	6	279.08
DMH D6	DMH D1	DMH D1	63	0.010	6	279.48
DMH D7	DMH D1	DMH D1	63	0.010	6	279.88
DMH D8	DMH D1	DMH D1	63	0.010	6	280.28
DMH D9	DMH D1	DMH D1	63	0.010	6	280.68
DMH D10	DMH D1	DMH D1	63	0.010	6	281.08
DMH D11	DMH D1	DMH D1	63	0.010	6	281.48
DMH D12	DMH D1	DMH D1	63	0.010	6	281.88
DMH D13	DMH D1	DMH D1	63	0.010	6	282.28
DMH D14	DMH D1	DMH D1	63	0.010	6	282.68
DMH D15	DMH D1	DMH D1	63	0.010	6	283.08
DMH D16	DMH D1	DMH D1	63	0.010	6	283.48
DMH D17	DMH D1	DMH D1	63	0.010	6	283.88
DMH D18	DMH D1	DMH D1	63	0.010	6	284.28
DMH D19	DMH D1	DMH D1	63	0.010	6	284.68
DMH D20	DMH D1	DMH D1	63	0.010	6	285.08
DMH D21	DMH D1	DMH D1	63	0.010	6	285.48
DMH D22	DMH D1	DMH D1	63	0.010	6	285.88
DMH D23	DMH D1	DMH D1	63	0.010	6	286.28
DMH D24	DMH D1	DMH D1	63	0.010	6	286.68
DMH D25	DMH D1	DMH D1	63	0.010	6	287.08
DMH D26	DMH D1	DMH D1	63	0.010	6	287.48
DMH D27	DMH D1	DMH D1	63	0.010	6	287.88
DMH D28	DMH D1	DMH D1	63	0.010	6	288.28
DMH D29	DMH D1	DMH D1	63	0.010	6	288.68
DMH D30	DMH D1	DMH D1	63	0.010	6	289.08

Description	Pipe Data				Vertical Control	
	Inlet Structure	Outlet Structure	Length (ft)	Slope (ft/ft)	Invert Elevation	Rim/Surface Elevation @ Inlet
DMH E1	DMH E1	DMH E1	41	0.010	12	268.50
DMH E2	DMH E1	DMH E1	41	0.010	12	268.90
DMH E3	DMH E1	DMH E1	41	0.010	12	269.30
DMH E4	DMH E1	DMH E1	41	0.010	12	269.70
DMH E5	DMH E1	DMH E1	41	0.010	12	270.10
DMH E6	DMH E1	DMH E1	41	0.010	12	270.50
DMH E7	DMH E1	DMH E1	41	0.010	12	270.90
DMH E8	DMH E1	DMH E1	41	0.010	12	271.30
DMH E9	DMH E1	DMH E1	41	0.010	12	271.70
DMH E10	DMH E1	DMH E1	41	0.010	12	272.10
DMH E11	DMH E1	DMH E1	41	0.010	12	272.50
DMH E12	DMH E1	DMH E1	41	0.010	12	272.90
DMH E13	DMH E1	DMH E1	41	0.010	12	273.30
DMH E14	DMH E1	DMH E1	41	0.010	12	273.70
DMH E15	DMH E1	DMH E1	41	0.010	12	274.10
DMH E16	DMH E1	DMH E1	41	0.010	12	274.50
DMH E17	DMH E1	DMH E1	41	0.010	12	274.90
DMH E18	DMH E1	DMH E1	41	0.010	12	275.30
DMH E19	DMH E1	DMH E1	41	0.010	12	275.70
DMH E20	DMH E1	DMH E1	41	0.010	12	276.10
DMH E21	DMH E1	DMH E1	41	0.010	12	276.50
DMH E22	DMH E1	DMH E1	41	0.010	12	276.90
DMH E23	DMH E1	DMH E1	41	0.010	12	277.30
DMH E24	DMH E1	DMH E1	41	0.010	12	277.70
DMH E25	DMH E1	DMH E1	41	0.010	12	278.10
DMH E26	DMH E1	DMH E1	41	0.010	12	278.50
DMH E27	DMH E1	DMH E1	41	0.010	12	278.90
DMH E28	DMH E1	DMH E1	41	0.010	12	279.30
DMH E29	DMH E1	DMH E1	41	0.010	12	279.70
DMH E30	DMH E1	DMH E1	41	0.010	12	280.10

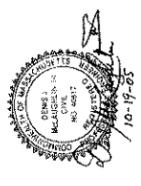
Description	Pipe Data				Vertical Control	
	Inlet Structure	Outlet Structure	Length (ft)	Slope (ft/ft)	Invert Elevation	Rim/Surface Elevation @ Inlet
DMH F1	DMH F1	DMH F1	41	0.010	12	268.50
DMH F2	DMH F1	DMH F1	41	0.010	12	268.90
DMH F3	DMH F1	DMH F1	41	0.010	12	2

PLAN No. 955 OF 1998



N/F NAGOS W/O

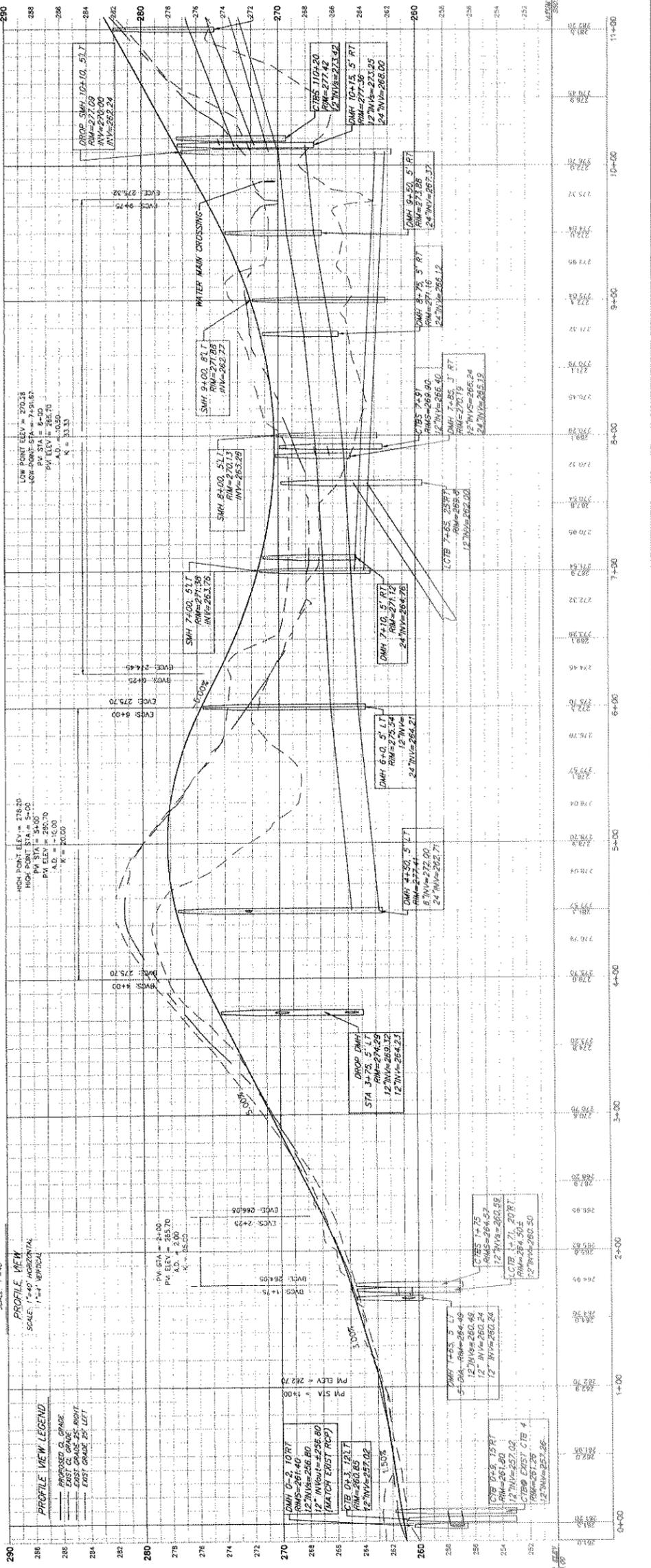
NOTES  
 1. SEE DEMOLITION PLANS FOR REMOVAL OF EXISTING HIGH RIDGE ROAD STRUCTURES.  
 2. SEE GRADING AND DRAINAGE PLAN (SHEET 100-00-5 FOR ALL DRAINAGE LINE AND OUTLET DATA.  
 3. SEE UTILITY PLANS (SHEETS 100-UP1 thru 4) FOR ALL SEWER LINE DATA.



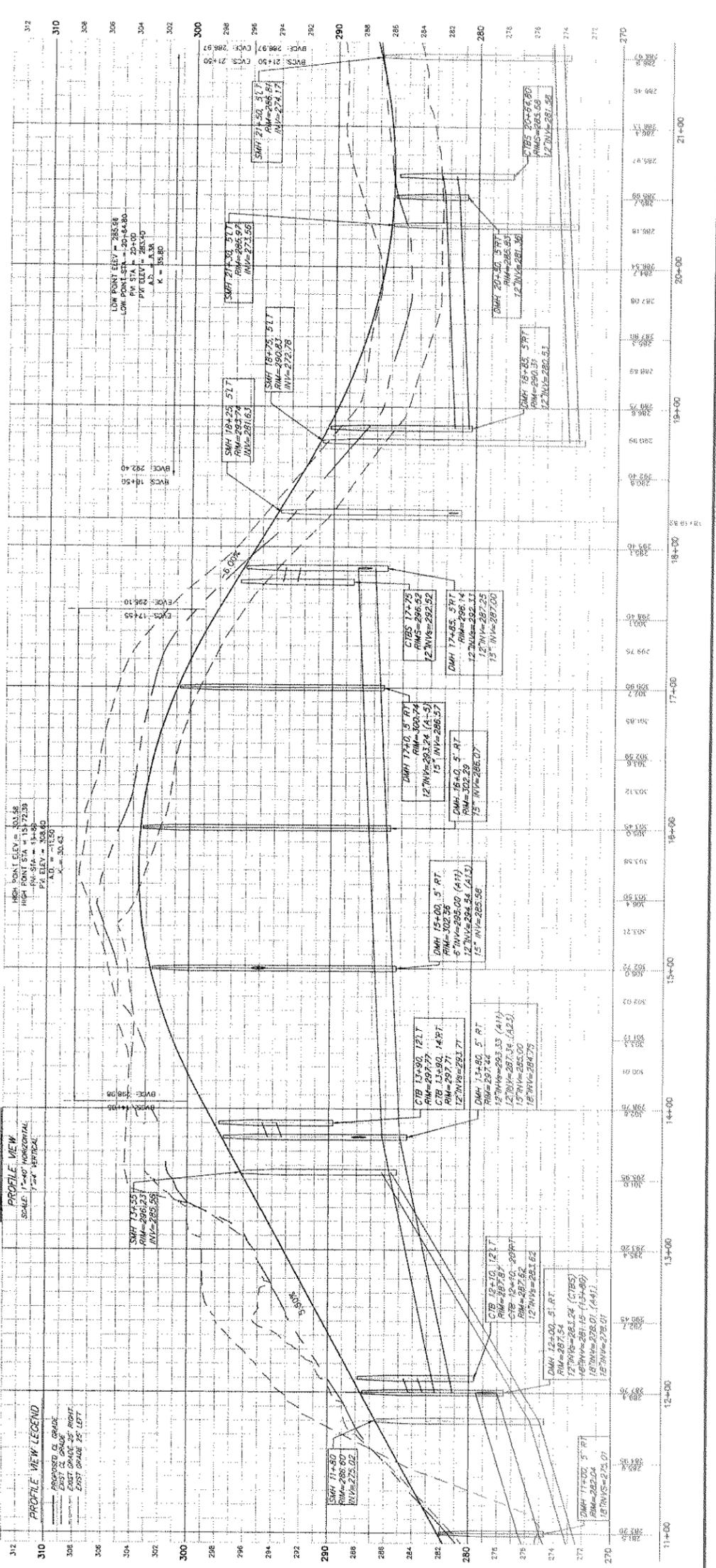
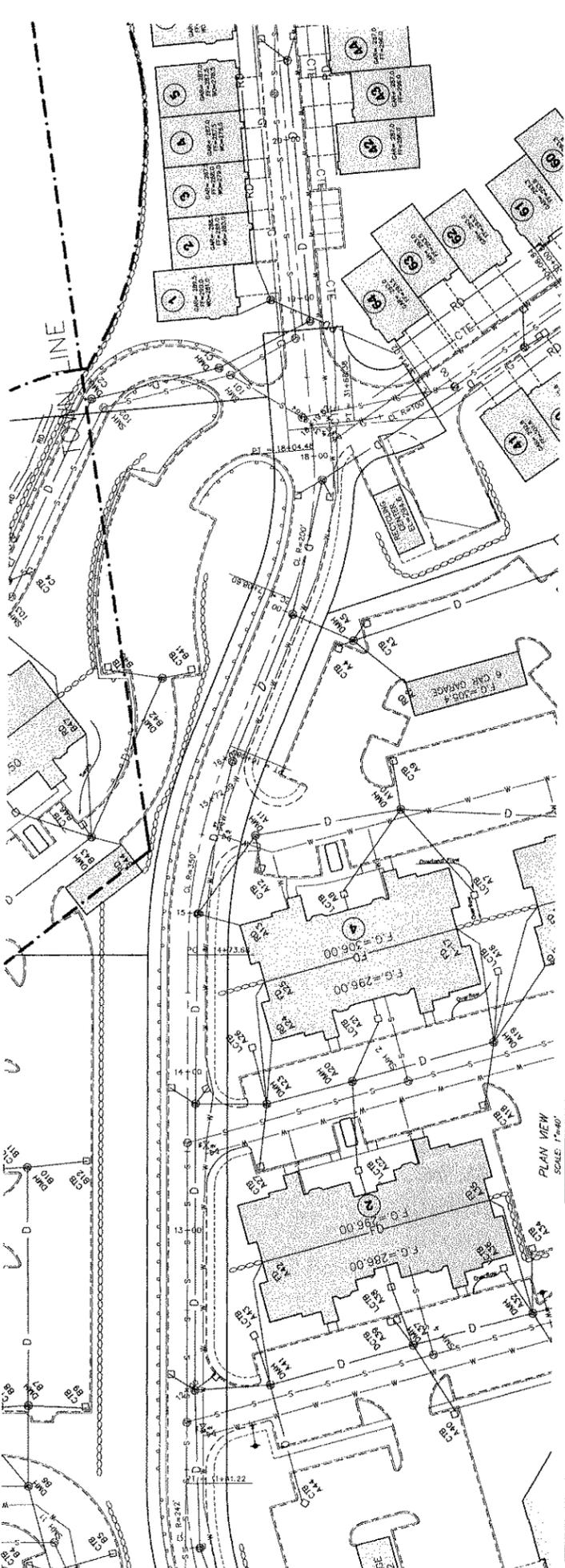
**LAUREL HILL DRIVE**  
 Plan & Profile 0 to 11+0

405 Development Plan in  
 ACTON & WESTFORD, MASS.  
 PREPARED FOR  
**Woodlands at Laurel Hill, LLC**  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801

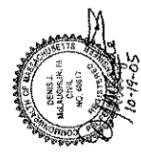
SCALE: AS SHOWN DATE: October 2005  
**PLACES**  
 Site Consultants, Inc.  
 PLANNING, LANDSCAPE ARCHITECTURE, CIVIL, ENGINEERING, SURVEYING  
 694 MAIN STREET, SUITE 3  
 HOLDEX, MA 01520-1862  
 508.859.0333 Fax: 508.859.0904  
 EMAIL: places@verizon.net  
 PROJECT NO. 04-108 PLAN No. 955-PR-1



PLAN No. 956 OF 1998



**NOTES:**  
 1. SEE DEMOLITION PLANS FOR REMOVAL OF EXISTING HIGH RIDGE ROAD STRUCTURES.  
 2. SEE GRADING AND DRAINAGE PLAN (SHEET 100-00-S) FOR ALL DRAINAGE LINE AND OUTLET DATA.  
 3. SEE UTILITY PLANS (SHEETS 100-UP1 thru 4) FOR ALL SEWER LINE DATA.



**LAUREL HILL DRIVE**  
 Plan & Profile 11+0 to 21+0

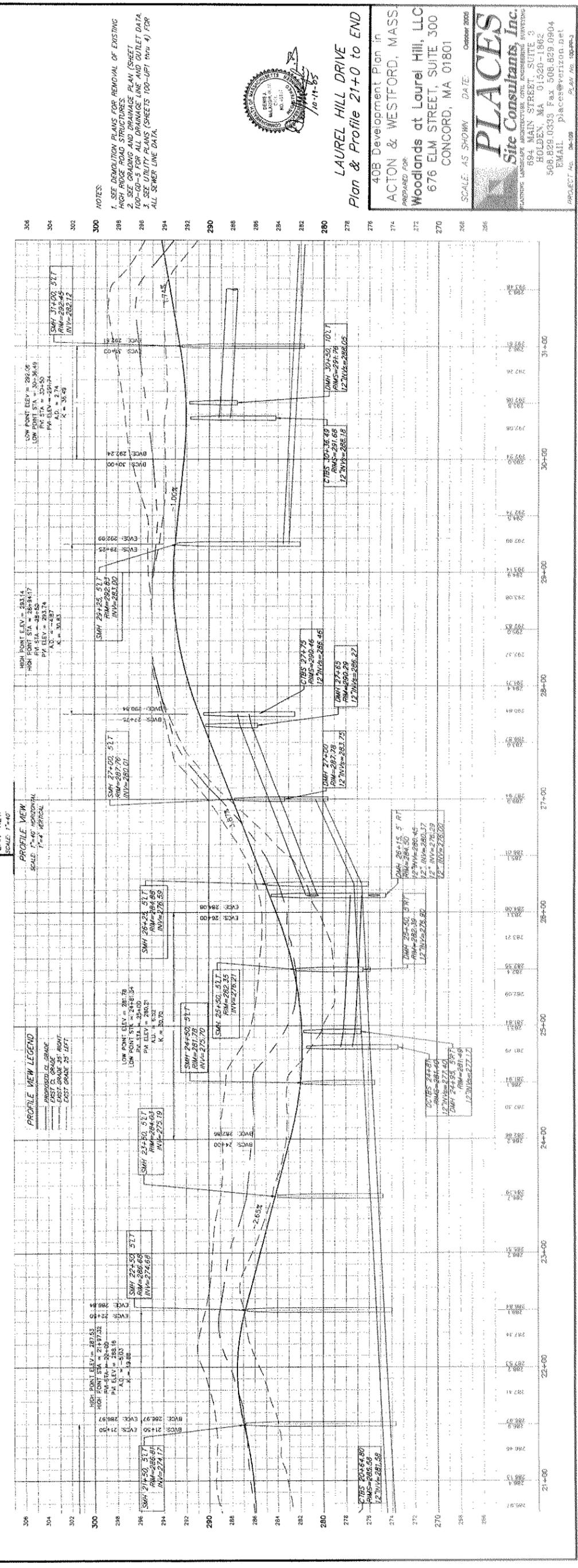
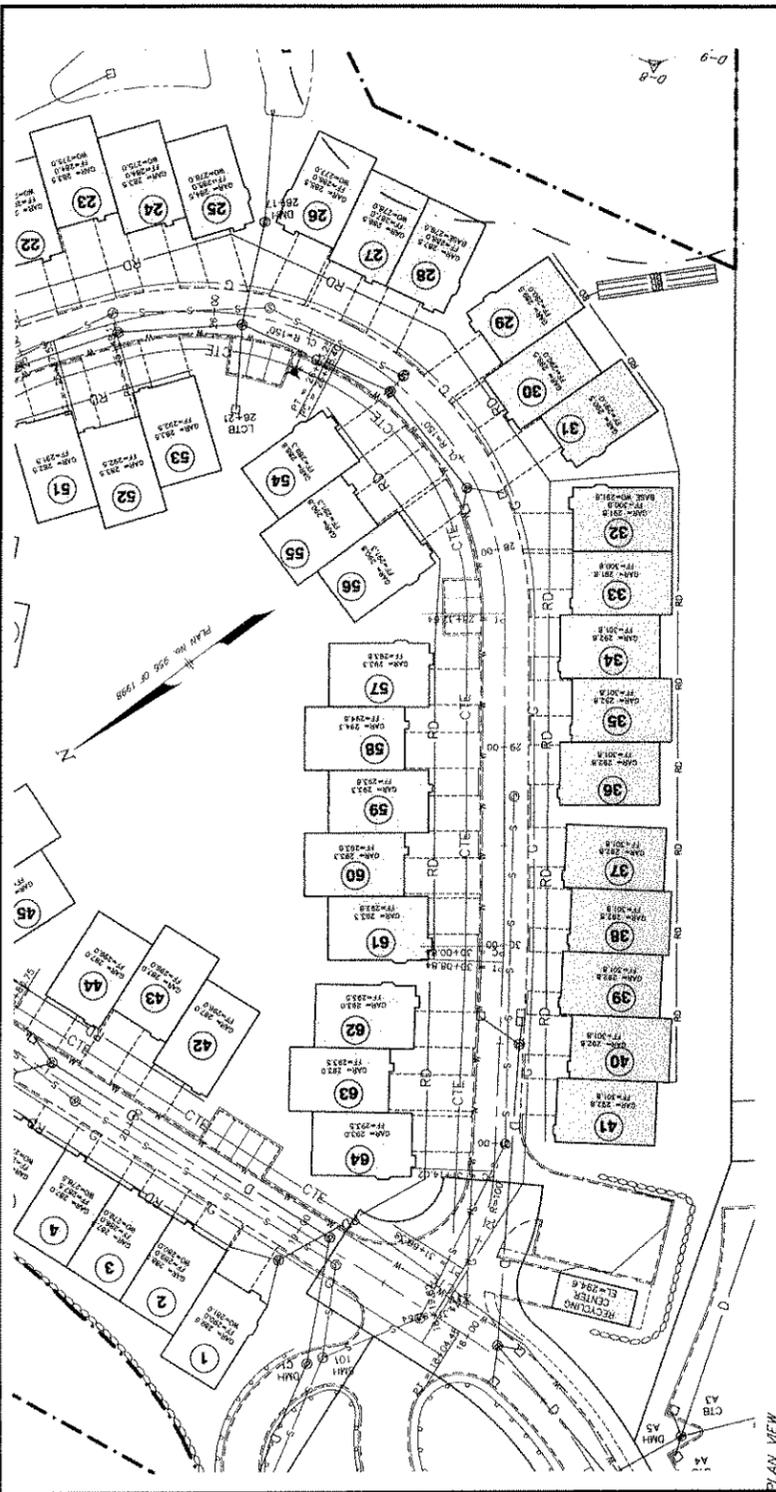
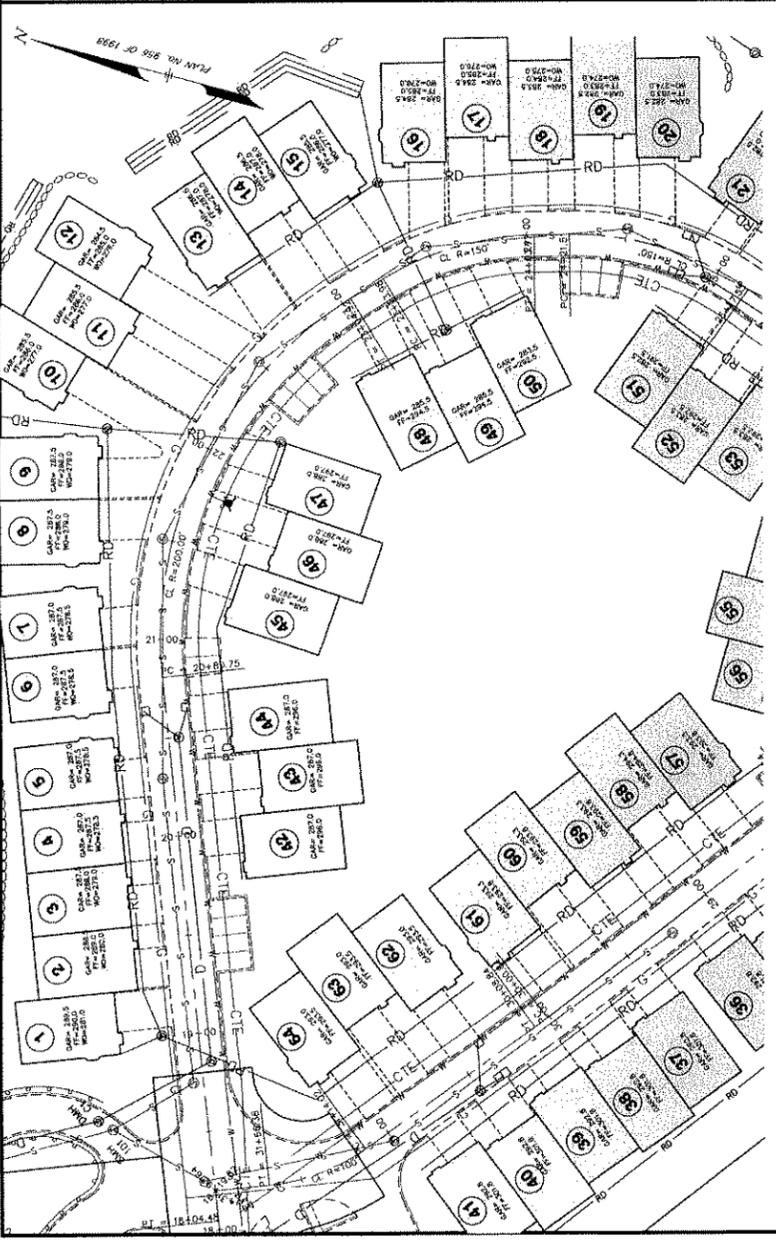
40B Development Plan in  
 ACTON & WESTFORD, MASS  
 PREPARED FOR:  
**Woodlands at Laurel Hill, LLC**  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801

SCALE AS SHOWN DATE: October 2005

**PLACES**  
 Site Consultants, Inc.

LANDSCAPE ARCHITECTURE, CIVIL ENGINEERING, SURVEYING  
 694 MAIN STREET, SUITE 3  
 HOLDEN, MA 01520-1862  
 508.839.0333 Fax 508.829.0904  
 EMAIL: places@verizon.net

PROJECT No. 04-108 PLAN No. 956-2



PLAN VIEW  
SCALE: 1"=40'

PROFILE VIEW  
SCALE: 1"=4' HORIZONTAL  
1"=4' VERTICAL

PROFILE VIEW LEGEND  
 --- PROPOSED GRADE  
 --- EXIST. G. GRADE  
 --- EXIST. G. GRADE 25' AWAY  
 --- EXIST. G. GRADE 50' AWAY  
 --- EXIST. G. GRADE 75' AWAY  
 --- EXIST. G. GRADE 100' AWAY  
 --- EXIST. G. GRADE 125' AWAY  
 --- EXIST. G. GRADE 150' AWAY  
 --- EXIST. G. GRADE 175' AWAY  
 --- EXIST. G. GRADE 200' AWAY  
 --- EXIST. G. GRADE 225' AWAY  
 --- EXIST. G. GRADE 250' AWAY  
 --- EXIST. G. GRADE 275' AWAY  
 --- EXIST. G. GRADE 300' AWAY  
 --- EXIST. G. GRADE 325' AWAY  
 --- EXIST. G. GRADE 350' AWAY  
 --- EXIST. G. GRADE 375' AWAY  
 --- EXIST. G. GRADE 400' AWAY  
 --- EXIST. G. GRADE 425' AWAY  
 --- EXIST. G. GRADE 450' AWAY  
 --- EXIST. G. GRADE 475' AWAY  
 --- EXIST. G. GRADE 500' AWAY

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LAUREL HILL DRIVE  
 Plan & Profile 21+0 to END

40B Development Plan in  
 ACTON & WESTFORD, MASS

WOODLANDS at Laurel Hill, LLC  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801

SCALE: AS SHOWN DATE: October 2006

PLACES  
 Site Consultants, Inc.  
 684 MAIN STREET, SUITE 3  
 HOLDEN, MA 01520-1882  
 508.829.0339 Fax 508.829.0904  
 EMAIL: places@verizon.net

PROJECT No. 04-038  
 04-038

NOTES:  
 1. SEE REMOVAL PLANS FOR REMOVAL OF EXISTING HIGH BRIDGE ROAD STRUCTURES.  
 2. SEE GRADING AND DRAINAGE PLAN (SHEET 100-GD-5 FOR ALL DRAINAGE LINE AND GULET DATA  
 3. SEE UTILITY PLANS (SHEETS 100-UT1 thru 4) FOR ALL SEWER LINE DATA.

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DMH 29+25, 101.7  
 RM=281.68  
 INV=286.02

DMH 29+50, 101.7  
 RM=281.68  
 INV=286.02

DMH 30+00, 101.7  
 RM=281.68  
 INV=286.02

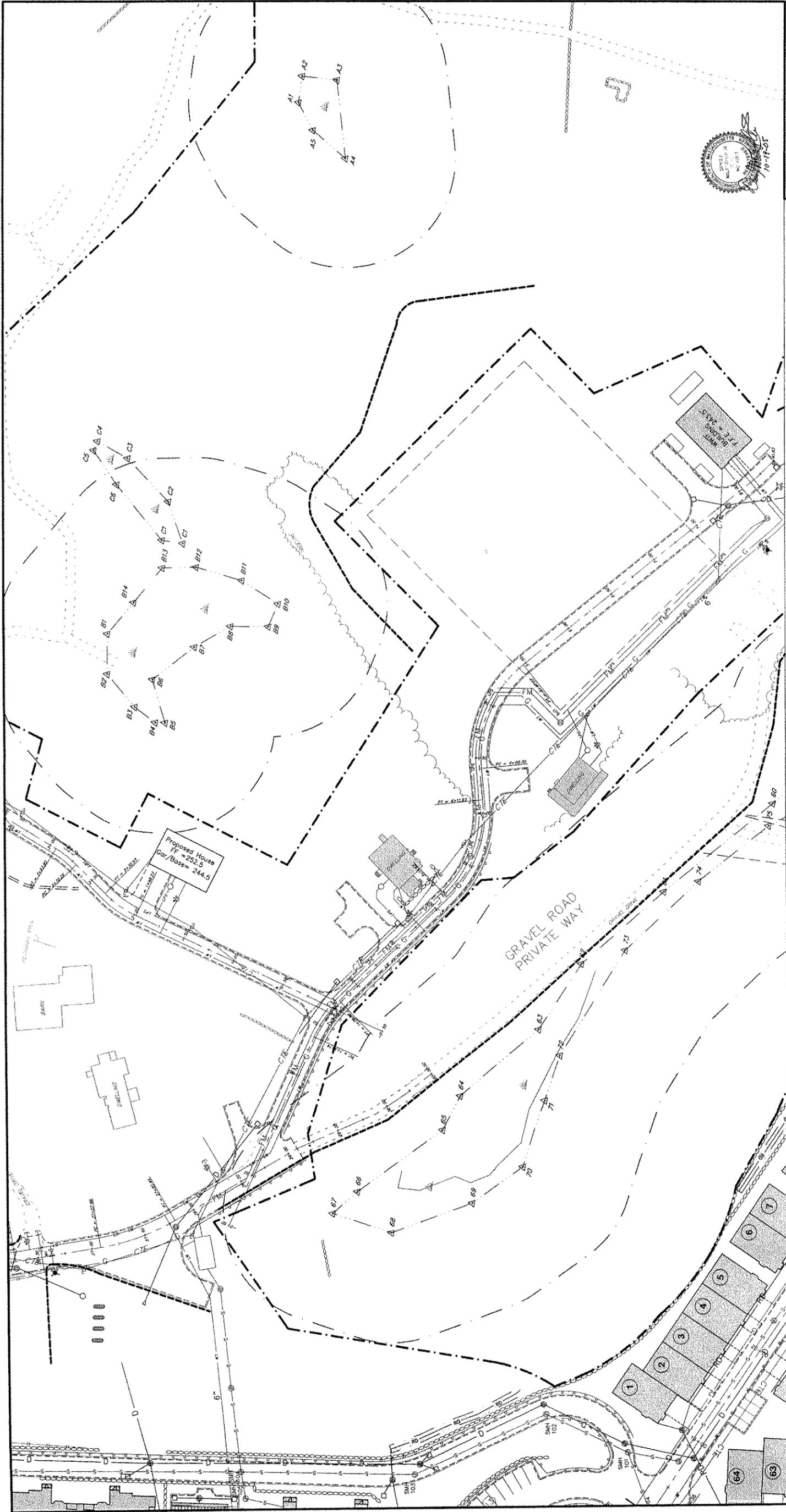
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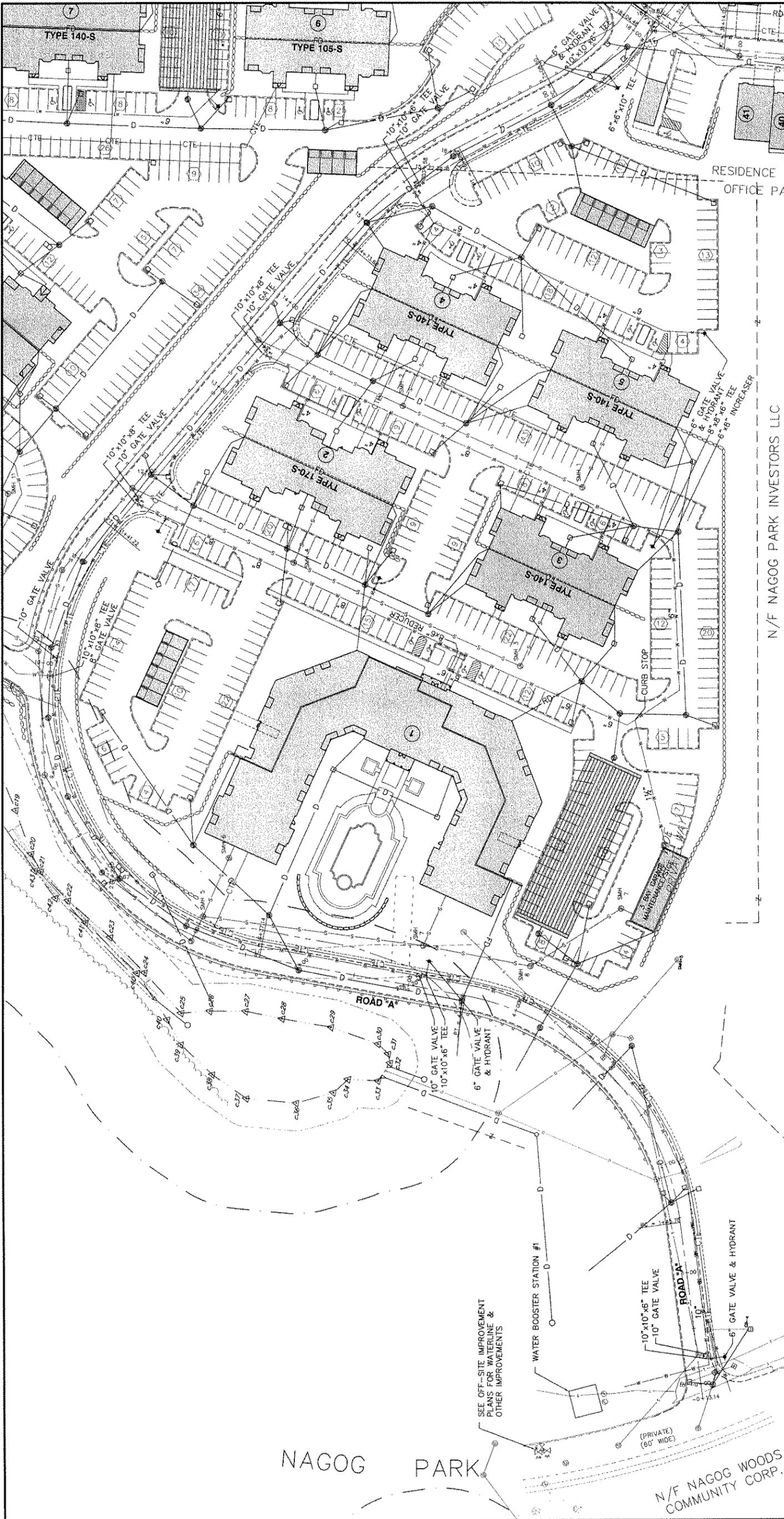


Utilities Improvements Plan in  
 ACTON & WESTFORD, MASS.  
 PREPARED FOR:  
**Woodlands at Laurel Hill, LLC**  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801

SCALE: 1" = 40'  
 DATE: October 15, 2005

**PLACES**  
 Site Consultants, Inc.  
 PLANNING, LANDSCAPE ARCHITECTURE, CIVIL, ENVIRONMENTAL, SURVEYING  
 604 MAIN STREET, SUITE 3  
 HOLDEN, MA 01520-1862  
 508.829.0333 Fax 508.829.0904  
 EMAIL: places@verizon.net  
 PROJECT NO. 04-98 PL 447 04 18042

Description	Structure	Outer Station	Length (ft)	Slope (%)	Pipe Size (in)	Invert Elevation		Material
						Manhole	Outlet	
SM# 20+00	SM# 19+25	155	0.005	8	273.85	272.75	265.87	
SM# 19+75	SM# 191	47	0.005	8	272.78	274.65	281.83	
SM# 101	SM# 102	82	0.005	8	272.54	272.13	262.50	
SM# 102	SM# 103	121	0.008	8	271.93	269.41	262.50	
SM# 103	SM# 104	158	0.005	8	269.41	263.14	256.50	
RD 03.6	SM# 105	58	0.020	8	264.05	261.30		
SM# 105	SM# 106	24	0.040	8	254.10	252.14	268.80	



Utilities Improvements Plan in  
 ACTON & WESTFORD, MASS.  
 PREPARED FOR  
**Woodlands at Laurel Hill, LLC**  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801

SCALE: 1"=40'  
 October 19, 2005

**PLACES**  
 Site Consultants, Inc.  
 694 MAIN STREET, SUITE 3  
 HOLDEN, MA 01520-1962  
 508.829.0333 Fax 508.828.8904  
 EMAIL places@verizon.net

N/F NAGOG PARK INVESTORS LLC

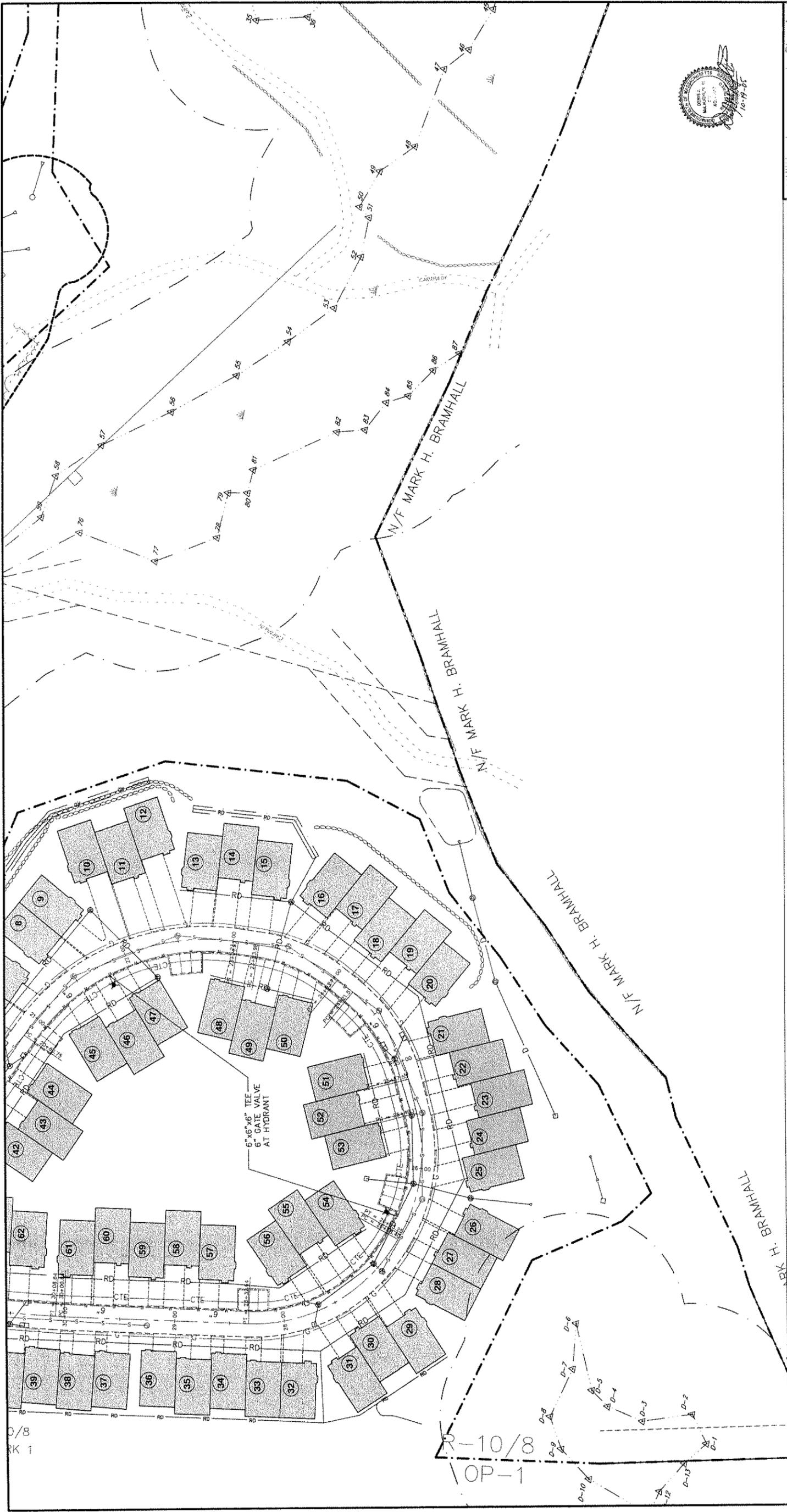
SM#	11-80	178	0.0080	8	265.56	275.00	285.20
SM# 11-80	SM# 10-10	97	0.0018	8	275.00	275.00	286.80
SM# 9-5	SM# 10-10	102	0.005	8	282.75	282.24	271.88
SM# 8-06	SM# 8-00	103	0.005	8	285.26	282.74	283.28
SM# 8-00	SM# 8-00	103	0.005	8	283.76	283.26	289.78
SM# 5	SM# 7-00	74	0.005	8	282.89	285.78	273.50
SM# 1 - NORTH	SM# 6	11	0.0040	8	275.00	274.52	
SM# 6	SM# 7	58	0.0030	8	285.94	285.88	288.20
SM# 7	SM# 5	201	0.0060	8	275.00	285.98	276.28
BLDG 1 - SOUTH	SM# 1	48	0.006	8	275.00	272.75	
SM# 6	SM# 1	104	0.005	8	275.00	270.59	277.80
SM# 3	SM# 5	12	0.0040	8	283.00	282.00	
SM# 3	SM# 5	57	0.0040	8	273.88	273.00	288.36

Reel Structure	Color	Length (ft)	Slope (ft)	Flow (GPM)	Invert Elevation	Outlet Elevation	Flow Rate (GPM)
BLDG 3	SM# 1	61	0.0000	6	294.27	286.79	
SM# 1	SM# 2	178	0.0100	6	288.76	287.00	289.10
BLDG 4	SM# 2	88	0.0410	6	289.30	287.50	
SM# 2	SM# 12-55	444	0.0100	6	287.40	285.50	284.41
BLDG 3	SM# 3	81	0.0100	6	284.16	283.59	
SM# 3	SM# 4	225	0.0000	6	283.05	277.10	288.70
BLDG 2	SM# 4	58	0.0000	6	286.00	277.10	
SM# 4	SM# 11-80	160	0.0100	6	277.10	273.82	285.50



SEE OFF-SITE IMPROVEMENT  
 PLANS FOR WATERLINE &  
 OTHER IMPROVEMENTS

N/F NAGOG WOODS  
 COMMUNITY CORP.



Utilities Improvements Plan in  
**ACTION & WESTFORD, MASS.**  
 PREPARED FOR:  
**Woodlands at Laurel Hill, LLC**  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801  
 SCALE: 1" = 40'  
 DATE: October 19, 2005

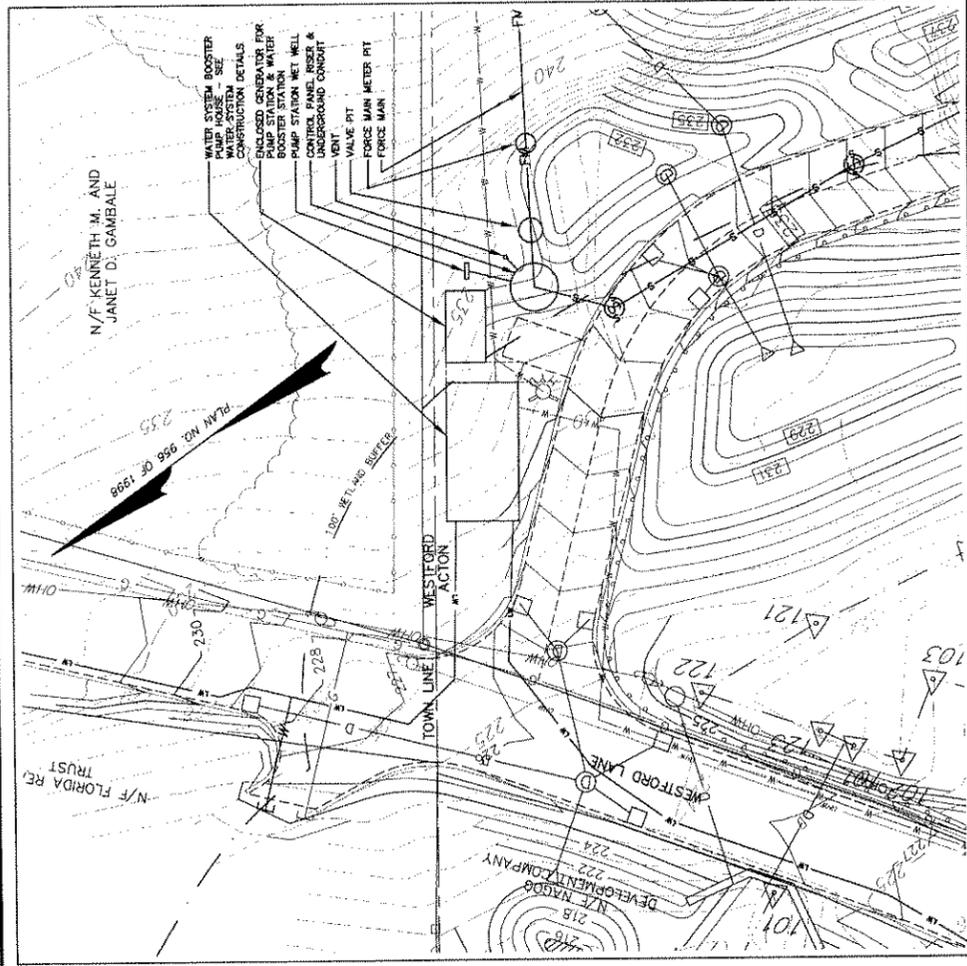
**PLACES**  
 Site Consultants, Inc.  
 694 MAIN STREET, SUITE 3  
 HOLDEN, MA 01520-1862  
 508.929.0333 Fax 508.829.0904  
 EMAIL: places@verizon.net  
 PROJECT No. 04-08

Description	Pipe Data			Vertical Control	
	Length (ft)	Slope (ft/ft)	Size (in)	Invert Elevation	Outer Elevation
1. Sewer	73	0.047	8	270.01	270.59
2. Sewer	76	0.035	8	270.59	270.21
3. Sewer	101	0.035	8	270.21	269.84
4. Sewer	102	0.035	8	270.21	270.19
5. Sewer	102	0.035	8	270.19	270.00
6. Sewer	102	0.035	8	270.00	274.17
7. Sewer	102	0.035	8	274.17	273.96

NOTES:  
 1. CABLE, TELEPHONE, ELECTRIC UTILITIES ARE SHOWN FOR PLANNING & COORDINATION PURPOSES. SPECIFIC CONSTRUCTION LOCATIONS SHALL BE PER THE INDIVIDUAL UTILITIES.  
 2. SEE SHEET "OP" FOR LEGEND.  
 3. SEWER LINE & MANHOLE INFORMATION ARE SHOWN ON LOT 4 ROADWAY PLAN/PROFILE SHEETS.

0/8  
 RK 1

OP-10/8  
 OP-1



PLAN VIEW  
SCALE: 1" = 20'

**DESIGN CRITERIA**

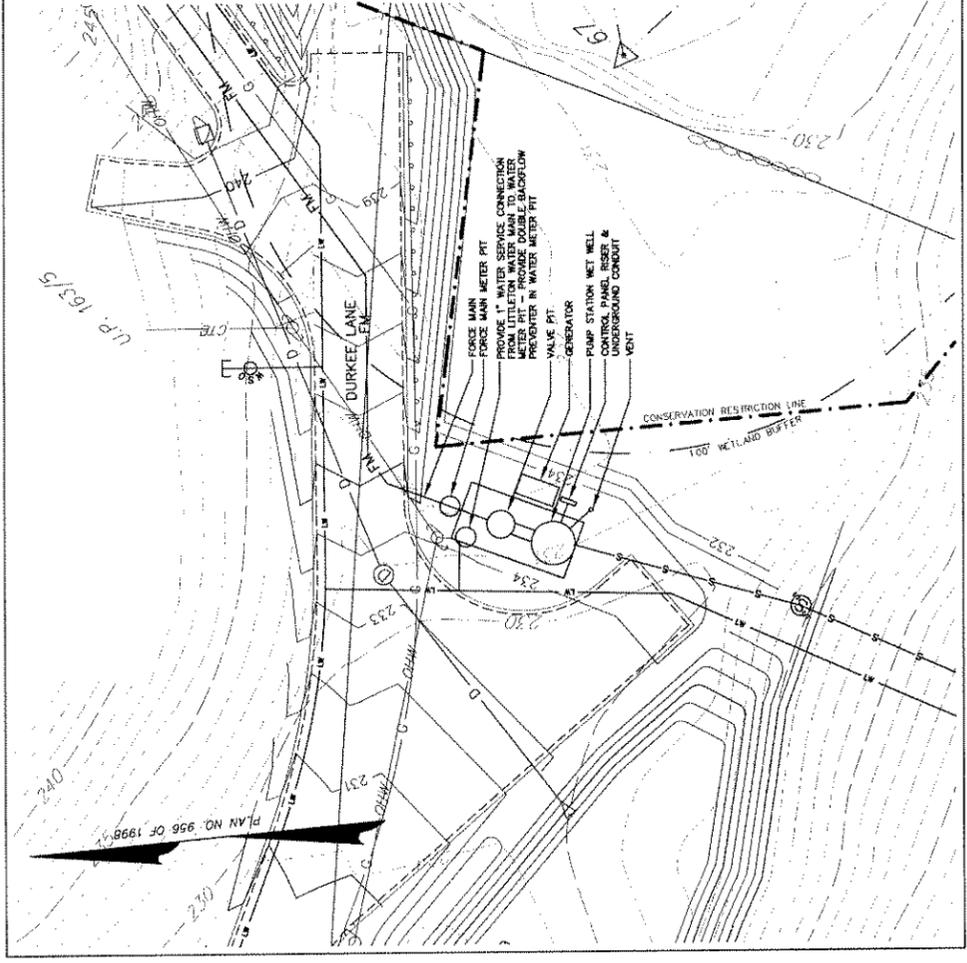
USE	AVG. DAILY FLOW	TOTAL FLOW
568 APARTMENT	110 GAL/DAY	62,480 GAL/DAY
100 LOCKER FITNESS	20 GAL/DAY	2,000 GAL/DAY
5 EMPLOYEE	15 GAL/DAY	75 GAL/DAY
6A UNIT CONDOMINIUM	220 GAL/DAY	14,080 GAL/DAY
PER UNIT		78,635 GAL/DAY
TOTAL PUMP STATION DESIGN FLOW		78,635 GAL/DAY

**WET WELL DESIGN CRITERIA**  
 ASSUME 10% INFLOW FOR PEAK FACTOR DESIGN  
 52,235 GAL/DAY x 1.10 = 57,458 GAL/DAY  
 PEAKING FACTOR = 5  
 ESTIMATED MAXIMUM INFLOW RATE:  
 5 x 37,458 GAL/DAY x 1 DAY/1,440 MIN. = 200 GAL./MIN.  
 PUMP CYCLE VOLUME:  
 BASED ON 10 MINUTE RETENTION TIME FOR AVERAGE DAILY FLOW  
 52,235 GAL/DAY x 1 DAY/1,440 MIN x 10 MIN. = 363 GALLONS/CYCLE  
**PUMP SPECIFICATION**  
 THE ACCESS ROAD SEWER LIFT STATION SHALL BE EQUIPPED WITH TWO DISMOUNTABLE 7 1/2 HORSEPOWER NON-CLOG SEWAGE PUMPS. CAPABLE OF PASSING A 3" DIAMETER SOLID. THE PUMP SHALL BE CAPABLE OF PUMPING A MINIMUM OF 200 GPM AGAINST A TOTAL DYNAMIC HEAD OF 54 FEET. PUMP MOTORS SHALL OPERATE FROM A 480 VOLT/THREE PHASE POWER SOURCE.

**PUMP STATION SCHEDULE**

ITEM	PROPOSED	AS-BUILT
WET WELL INSIDE DIA. (FT.)	10"	10"
IMPERVIOUS SEWER SIZE (IN.)	8"	8"
FORCE MAIN SIZE (IN.)	225.80	225.80
INFLUENT SEWER INVERT	221.00	221.00
LOW WATER	221.00	221.00
PUMPS OFF	221.00	221.00
LEAD PUMP ON	221.00	221.00
LAG PUMP ON	221.00	221.00
HIGH WATER	221.00	221.00
WET WELL 50' TO 10' CENTER LINE ELEV.	224.84	224.84
WET WELL 50' TO 10' VALVE PIT	224.84	224.84
TOP SLAB WET WELL	215.00	215.00
WET WELL FLOOR	215.00	215.00
WET WELL CENTER LINE ELEV.	224.84	224.84
FORCE MAIN CENTER LINE ELEV.	224.84	224.84

**WET WELL BUOYANCY CALCULATIONS**  
 PRECAST CONCRETE WET WELL  
 EXTERIOR DIMENSIONS: 11'-0" DIA. x 15'-8" HEIGHT  
 EXTERIOR VOLUME: (1,480 CU. FT.)  
 INTERIOR DIMENSIONS: 11'-0" DIA. x 14'-4" HEIGHT  
 INTERIOR VOLUME: (1,125 CU. FT.)  
 WEIGHT: (1,490-1,125) x 150#/CF = 54,750#  
 ASSUME WATER AT FINISH GRADE (ELEVATION 234.0)  
 DISPLACED VOLUME= 1,390 CUBIC FEET  
 BUOYANCY FORCE= 1,390 CF x 62.5#/CF = 86,900#  
 ADDITIONAL BALLAST REQUIRED= 86,900-54,750 = 32,150#  
**BALLAST PROPOSED:**  
 OPTION 1 - 18" CAST IN SHELF  
 BACKFILL SOL. AROUND WET WELL SIDES= (3.14/4) x (14'-2" - 11'-2") x 14' x (100#/SF) = 30,920#  
 CONCRETE RING= (3.14/4) x (14'-2" - 11'-2") x .67 x (150#/CF) = 62.5#/CF = 3,450#  
 TOTAL BALLAST = 34,370#  
 OPTION 2 - CAST IN PLACE CONCRETE PAD  
 CONC. PAD = (13'-8" x 13'-8" x 10" THICK) x (150#/CF) = 62.5#/CF = 11,660#  
 BACKFILL SOL. AROUND WET WELL SIDES = (3.14/4) x (14'-2" - 11'-2") x 15' x (100#/SF) = 33,130#  
 TOTAL BALLAST = 44,800#  
**OTHER METHODS OF PROVIDING BALLAST FOR THE WET WELL MAY BE UTILIZED (I.E. PINNING TO LEGS, CAST IN PLACE PAD OVER STRUCTURE, ETC.) IF APPROVED BY THE ENGINEER.**



PLAN VIEW  
SCALE: 1" = 20'

**DESIGN CRITERIA**

USE	AVG. DAILY FLOW	TOTAL FLOW
568 APARTMENT	110 GAL/DAY	62,480 GAL/DAY
100 LOCKER FITNESS	20 GAL/DAY	2,000 GAL/DAY
5 EMPLOYEE	15 GAL/DAY	75 GAL/DAY
6A UNIT CONDOMINIUM	220 GAL/DAY	14,080 GAL/DAY
PER UNIT		78,635 GAL/DAY
TOTAL PUMP STATION DESIGN FLOW		78,635 GAL/DAY

**WET WELL DESIGN CRITERIA**  
 ASSUME 10% INFLOW FOR PEAK FACTOR DESIGN  
 78,635 GAL/DAY x 1.10 = 86,499 GAL/DAY  
 PEAKING FACTOR = 5  
 ESTIMATED MAXIMUM INFLOW RATE:  
 5 x 86,499 GAL/DAY x 1 DAY/1,440 MIN. = 300 GAL./MIN.  
 PUMP CYCLE VOLUME:  
 BASED ON 10 MINUTE RETENTION TIME FOR AVERAGE DAILY FLOW  
 78,635 GAL/DAY x 1 DAY/1,440 MIN x 10 MIN. = 544 GALLONS/CYCLE  
**PUMP SPECIFICATION**  
 THE ACCESS ROAD SEWER LIFT STATION SHALL BE EQUIPPED WITH TWO DISMOUNTABLE 7 1/2 HORSEPOWER NON-CLOG SEWAGE PUMPS. CAPABLE OF PASSING A 3" DIAMETER SOLID. THE PUMP SHALL BE CAPABLE OF PUMPING A MINIMUM OF 300 GPM AGAINST A TOTAL DYNAMIC HEAD OF 76 FEET. PUMP MOTORS SHALL OPERATE FROM A 480 VOLT/THREE PHASE POWER SOURCE.

**PUMP STATION SCHEDULE**

ITEM	PROPOSED	AS-BUILT
WET WELL INSIDE DIA. (FT.)	10"	10"
IMPERVIOUS SEWER SIZE (IN.)	8"	8"
FORCE MAIN SIZE (IN.)	228.14	228.14
INFLUENT SEWER INVERT	220.00	220.00
LOW WATER	220.00	220.00
PUMPS OFF	220.00	220.00
LEAD PUMP ON	220.00	220.00
LAG PUMP ON	220.00	220.00
HIGH WATER	220.00	220.00
WET WELL 50' TO 10' CENTER LINE ELEV.	228.84	228.84
WET WELL 50' TO 10' VALVE PIT	228.84	228.84
TOP SLAB WET WELL	215.00	215.00
WET WELL FLOOR	215.00	215.00
WET WELL CENTER LINE ELEV.	228.84	228.84
FORCE MAIN CENTER LINE ELEV.	228.84	228.84

**WET WELL BUOYANCY CALCULATIONS**  
 PRECAST CONCRETE WET WELL  
 EXTERIOR DIMENSIONS: 11'-0" DIA. x 15'-8" HEIGHT  
 EXTERIOR VOLUME: (1,584 CU. FT.)  
 INTERIOR DIMENSIONS: 11'-0" DIA. x 15'-4" HEIGHT  
 INTERIOR VOLUME: (1,204 CU. FT.)  
 WEIGHT: (1,584-1,204) x 150#/CF = 57,000#  
 ASSUME WATER AT FINISH GRADE (ELEVATION 234.0)  
 DISPLACED VOLUME= 1,490 CUBIC FEET  
 BUOYANCY FORCE= 1,490 CF x 62.5#/CF = 93,125#  
 ADDITIONAL BALLAST REQUIRED= 93,125-57,000 = 36,125#  
**BALLAST PROPOSED:**  
 OPTION 1 - 18" CAST IN SHELF  
 BACKFILL SOL. AROUND WET WELL SIDES= (3.14/4) x (14'-2" - 11'-2") x 15' x (100#/SF) = 33,130#  
 CONCRETE RING= (3.14/4) x (14'-2" - 11'-2") x .67 x (150#/CF) = 62.5#/CF = 3,450#  
 TOTAL BALLAST = 36,580#  
 OPTION 2 - CAST IN PLACE CONCRETE PAD  
 CONC. PAD = (13'-8" x 13'-8" x 10" THICK) x (150#/CF) = 62.5#/CF = 11,660#  
 BACKFILL SOL. AROUND WET WELL SIDES = (3.14/4) x (14'-2" - 11'-2") x 15' x (100#/SF) = 33,130#  
 TOTAL BALLAST = 44,800#  
**OTHER METHODS OF PROVIDING BALLAST FOR THE WET WELL MAY BE UTILIZED (I.E. PINNING TO LEGS, CAST IN PLACE PAD OVER STRUCTURE, ETC.) IF APPROVED BY THE ENGINEER.**

**PLAN NOTES:**  
 1. ALL CONSTRUCTION MATERIALS AND METHODOLOGIES SHALL CONFORM TO THE REQUIREMENTS OF THE LOCAL DEPARTMENT OF PUBLIC WORKS.  
 2. SHOP DRAWINGS OF ALL MATERIALS SHALL BE SUBMITTED TO THE DESIGN ENGINEER AND THE LOCAL DPW FOR APPROVAL PRIOR TO THE ORDERING OF MATERIALS.  
 3. EROSION CONTROLS AND DEWATERING PROCEDURES SHALL CONFORM TO THE RELEVANT PERMIT REQUIREMENTS.



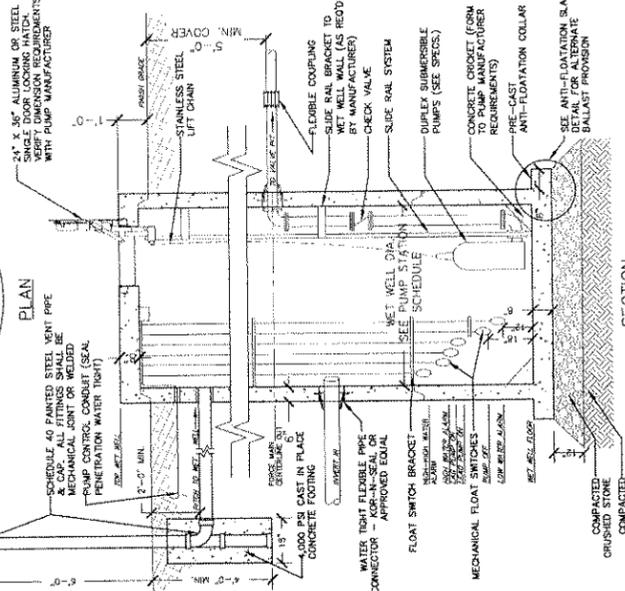
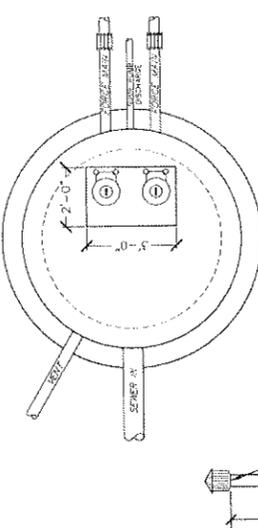
**FOR PERMITTING PURPOSES ONLY**  
**NOT FOR CONSTRUCTION**

**SEWER LIFT STATION CONSTRUCTION DETAILS**  
 40B Development Plan in ACTION & WESTFORD, MASS.  
**Woodlands at Laurel Hill, LLC**  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801

SCALE: AS SHOWN DATE: Oct. 19, 2005  
**PLACES**  
 Site Consultants, Inc.  
 694 MAIN STREET, SUITE 3  
 HOLDEY, MA 01520-1862  
 508.859.0933 Fax 508.829.0904  
 EMAIL: places@verizon.net  
 PROJECT: 2005-04-125 PL-24, 26, 29-31

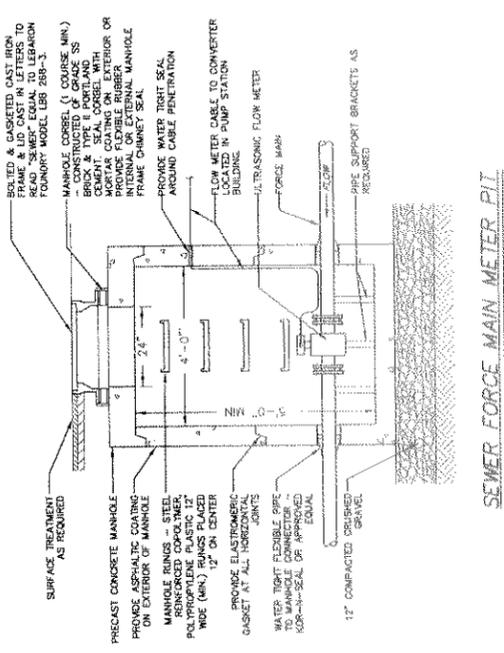
DURKEE LANE SEWER LIFT STATION

ACCESS ROAD SEWER LIFT STATION



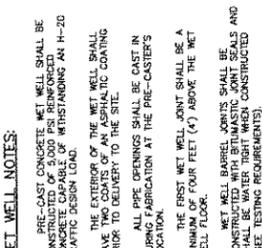
**SEWER LIFT STATION WET WELL**  
NOT TO SCALE

- NOTES:**
- MANHOLE COMPONENTS (BASE, SECTIONS, & CAP) SHALL BE 4,000 PSI PRECAST REINFORCED CONCRETE AND SHALL CONFORM TO ASTM C478 (PRECAST REINFORCED CONCRETE MANHOLE SECTIONS) AND CAPABLE OF WITHSTANDING AN H-20 TRUCK DESIGN LOAD.
  - ALL MANHOLE PENETRATIONS SHALL BE A MINIMUM OF SIX INCHES FROM ANY HORIZONTAL JOINT.
  - THE MANHOLE SHALL BE WATER TIGHT IN PLACE AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SEWER DEPARTMENT.
  - THE FLOW METER SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. THE MINIMUM LENGTH OF STRAIGHT PIPE (NO VALVES, FITTINGS OR OTHER OBSTRUCTIONS) BEFORE AND AFTER THE METER SHALL BE PROVIDED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
  - ELECTRICAL COMPONENTS SHALL BE INSTALLED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.



**SEWER FORCE MAIN METER PIT**  
NOT TO SCALE

- NOTES:**
- ROADWAY PATCH AND BASE/SUB-BASE SHALL BE INSTALLED AS DIRECTED BY THE HIGHWAY SUPERINTENDENT.
  - BEDDING, BLANKET, & BACKFILL MATERIALS SHALL BE COMPACTED TO SITE MAXIMUM DENSITY (MODIFIED PROCTOR) AT OPTIMUM MOISTURE CONTENT FOR BOTH CROSS COUNTRY AND ROADWAY INSTALLATION.
  - EARTH MATERIALS FOR FORCE MAIN INSTALLATION SHALL BE AS FOLLOWS UNLESS OTHERWISE DIRECTED BY THE ENGINEER OR THE APPROVING AUTHORITIES:
    - A. PIPE BEDDING: 1/2" TO 1" CRUSHED STONE CONTAINING NO MORE THAN 5% CRUSHED STONE.
    - B. BLANKET: 1/2" TO 1" CRUSHED STONE CONTAINING NO MORE THAN 5% CRUSHED STONE.
    - C. USE CRUSHED GRAVEL COMPACTED TO 95% RELATIVE DENSITY.
    - D. BACKFILL: 1/2" TO 1" CRUSHED STONE CONTAINING NO MORE THAN 5% CRUSHED STONE.
    - E. ROADWAY PATCH: 1/2" TO 1" CRUSHED STONE CONTAINING NO MORE THAN 5% CRUSHED STONE.
    - F. AT MAXIMUM DENSITY.
  - 4" MIN. LOAM AND SEED



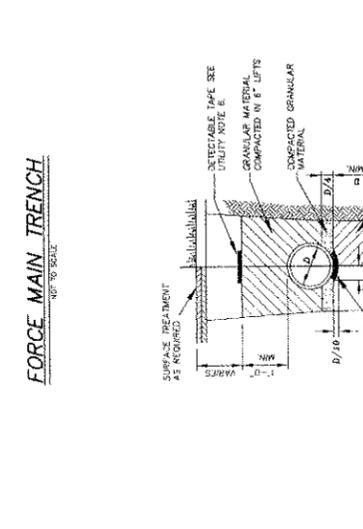
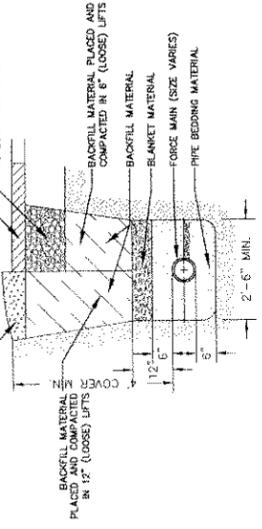
**FORCE MAIN TRENCH**  
NOT TO SCALE



**UTILITY TRENCH DETAIL**  
NOT TO SCALE

- WET WELL NOTES:**
- PRE-CAST CONCRETE WET WELL SHALL BE CONSTRUCTED OF 5,000 PSI REINFORCED CONCRETE CAPABLE OF WITHSTANDING AN H-20 TRUCK DESIGN LOAD.
  - THE EXTERIOR OF THE WET WELL SHALL BE FINISHED TO MATCH THE SURROUNDING CONCRETE PRIOR TO DELIVERY TO THE SITE.
  - ALL PIPE OPENINGS SHALL BE CAST IN PLACE DURING FABRICATION AT THE PRE-CASTER'S LOCATION.
  - THE FIRST WET WELL JOINT SHALL BE A MINIMUM OF FOUR FEET (4') ABOVE THE WET WELL FLOOR.
  - WET WELL BARREL JOINTS SHALL BE CAST IN PLACE AND SHALL BE WATER TIGHT WHEN CONSTRUCTED (SEE TESTING REQUIREMENTS).
  - ALL FLOAT ELEVATIONS REFER TO THE ACTIVATION LEVEL OF THE FLOAT SWITCH. THE ACTIVATION LEVEL SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS PRIOR TO INSTALLATION.
  - THE ANTI-FLOATATION COLLAR DEPICTED ON SHEET 10 SHALL BE CAST IN CONNECTION WITH THE BASE SECTION AT THE FACTORY.
  - IN LIEU OF THE PRE-CAST ANTI-FLOATATION COLLAR, THE CONTRACTOR MAY PROVIDE AN ANTI-FLOATATION SLAB - SEE SOLENOID VALVE CALCULATIONS AND ANTI-FLOATATION SLAB DETAIL FOR ADDITIONAL INFORMATION.

- CONTROL PANEL RISER NOTES:**
- ALL WORKING MATERIALS AND PROCEDURES SHALL MEET ALL LOCAL, STATE AND FEDERAL REQUIREMENTS.
  - SEE UTILITY PLANS FOR LOCATION.
  - A PRE-MANUFACTURED RISER MAY BE SUBSTITUTED - SUBMIT SHOP DRAWINGS TO DESIGN ENGINEER AND LOCAL AUTHORITY FOR APPROVAL.
  - THE CONTRACTOR SHALL FURNISH A PUMP/WELL DATA PLATE IN THE ELECTRICAL ENCLOSURE.



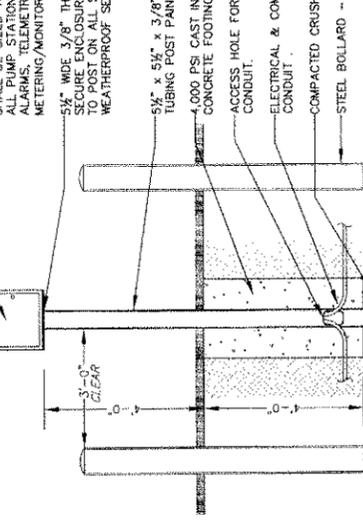
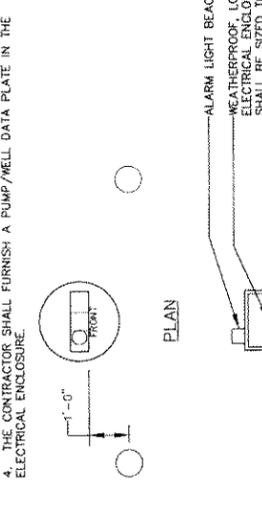
**CONTROL PANEL RISER**  
NOT TO SCALE

- WET MAIN NOTES:**
- PRE-CAST CONCRETE WET MAIN SHALL BE CONSTRUCTED OF 5,000 PSI REINFORCED CONCRETE CAPABLE OF WITHSTANDING AN H-20 TRUCK DESIGN LOAD.
  - THE EXTERIOR OF THE WET MAIN SHALL BE FINISHED TO MATCH THE SURROUNDING CONCRETE PRIOR TO DELIVERY TO THE SITE.
  - ALL PIPE OPENINGS SHALL BE CAST IN PLACE DURING FABRICATION AT THE PRE-CASTER'S LOCATION.
  - THE FIRST WET MAIN JOINT SHALL BE A MINIMUM OF FOUR FEET (4') ABOVE THE WET MAIN FLOOR.
  - WET MAIN BARREL JOINTS SHALL BE CAST IN PLACE AND SHALL BE WATER TIGHT WHEN CONSTRUCTED (SEE TESTING REQUIREMENTS).
  - ALL FLOAT ELEVATIONS REFER TO THE ACTIVATION LEVEL OF THE FLOAT SWITCH. THE ACTIVATION LEVEL SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS PRIOR TO INSTALLATION.
  - THE ANTI-FLOATATION COLLAR DEPICTED ON SHEET 10 SHALL BE CAST IN CONNECTION WITH THE BASE SECTION AT THE FACTORY.
  - IN LIEU OF THE PRE-CAST ANTI-FLOATATION COLLAR, THE CONTRACTOR MAY PROVIDE AN ANTI-FLOATATION SLAB - SEE SOLENOID VALVE CALCULATIONS AND ANTI-FLOATATION SLAB DETAIL FOR ADDITIONAL INFORMATION.



**FORCE MAIN DISCHARGE MANHOLE**  
NOT TO SCALE

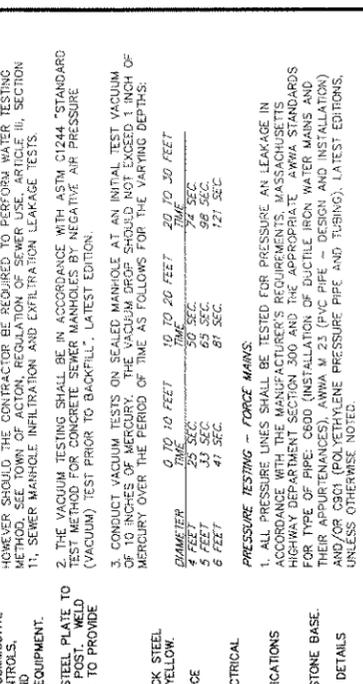
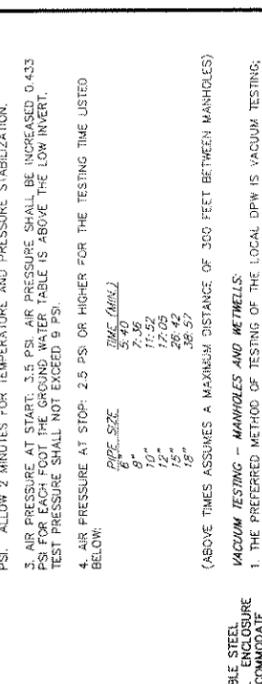
- WATER TIGHTNESS TESTING PROCEDURE:**
- THE CONTRACTOR SHALL COORDINATE TESTING SCHEDULE AND PROCEDURES WITH THE SEWER DEPARTMENT. TESTING PROCEDURES MAY BE REQUIRED BY THE DPW. SHOULD ANY ADDITIONAL TESTING PROCEDURES BE REQUIRED BY THE DPW, THE LEAK SHALL BE LOCATED AND THE NECESSARY REPAIRS BE MADE TO ELIMINATE THE LEAK. THE SECTION SHALL THEN BE RETESTED AS DIRECTED BY THE DPW.
- PRESSURE TESTING - GRAVITY SEWERS:**
- THE PREFERRED METHOD OF TESTING OF THE DPW IS AIR TESTING; HOWEVER, SHOULD THE CONTRACTOR BE REQUIRED TO PERFORM WATER TESTING METHOD, SEE TOWN OF ACTON, REGULATION OF SEWER USE, ARTICLE III, SECTION 10, SEWER LINE TESTING. LOW PRESSURE AIR TESTS SHALL CONFORM TO UNIBELL PLASTIC PIPE ASSOCIATION, RECOMMENDED PRACTICE FOR LOW-PRESSURE AIR TESTING OF INSTALLED SEWER PIPE, UNI-B-6-88.
  - AIR TESTING, AIR IS TO BE APPLIED SLOWLY UNTIL THE PRESSURE REACHED 4 PSI. ALLOW 2 MINUTES FOR TEMPERATURE AND PRESSURE STABILIZATION.
  - AIR PRESSURE AT START: 3.5 PSI. AIR PRESSURE SHALL BE INCREASED 0.433 PSI FOR EACH FOOT THE GROUNDING IN TABLE IS ABOVE THE LOW INVERT. TEST PRESSURE SHALL NOT EXCEED 9 PSI.
  - AIR PRESSURE AT STOP: 2.5 PSI OR HIGHER FOR THE TESTING TIME LISTED BELOW:
- | PIPE SIZE | TEST TIME (MIN) |
|-----------|-----------------|
| 4"        | 3:40            |
| 6"        | 4:40            |
| 8"        | 5:40            |
| 10"       | 6:40            |
| 12"       | 7:40            |
| 15"       | 8:40            |
| 18"       | 9:40            |
- (ABOVE TIMES ASSUMES A MAXIMUM DISTANCE OF 300 FEET BETWEEN MANHOLES)
- VACUUM TESTING - MANHOLES AND METWELLS:**
- THE PREFERRED METHOD OF TESTING OF THE LOCAL DPW IS VACUUM TESTING; HOWEVER, SHOULD THE CONTRACTOR BE REQUIRED TO PERFORM WATER TESTING METHOD, SEE TOWN OF ACTON, REGULATION OF SEWER USE, ARTICLE III, SECTION 10, SEWER LINE TESTING. LOW PRESSURE AIR TESTS SHALL CONFORM TO UNIBELL PLASTIC PIPE ASSOCIATION, RECOMMENDED PRACTICE FOR LOW-PRESSURE AIR TESTING OF INSTALLED SEWER PIPE, UNI-B-6-88.
  - THE VACUUM TESTING SHALL BE IN ACCORDANCE WITH ASTM C1244 "STANDARD TEST METHOD FOR CONCRETE SEWER MANHOLES BY NEGATIVE AIR PRESSURE (VACUUM) TEST PRIOR TO BACKFILL", LATEST EDITION.
  - CONDUCT VACUUM TESTS ON SEALED MANHOLE AT AN INITIAL TEST VACUUM OF 10 INCHES OF MERCURY. THE VACUUM DROP SHOULD NOT EXCEED 1 INCH OF MERCURY OVER THE PERIOD OF TIME AS FOLLOWS FOR THE VARYING DEPTHS:
- | DIAMETER | 0' TO 10' FEET | 10' TO 20' FEET | 20' TO 30' FEET |
|----------|----------------|-----------------|-----------------|
| 4 FEET   | 25 SEC.        | 50 SEC.         | 75 SEC.         |
| 5 FEET   | 33 SEC.        | 65 SEC.         | 95 SEC.         |
| 6 FEET   | 41 SEC.        | 81 SEC.         | 121 SEC.        |
- PRESSURE TESTING - FORCE MAINS:**
- ALL PRESSURE LINES SHALL BE TESTED FOR PRESSURE AN LEAKAGE IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS. MASSACHUSETTS HIGHWAY DEPARTMENT SECTION 300 AND THE APPROPRIATE FEDERAL STANDARDS FOR THE TESTING OF FORCE MAINS SHALL BE APPLIED TO ALL FORCE MAINS. THE TEST PRESSURE SHALL BE 1.5 TIMES THE DESIGN PRESSURE (FOR DESIGN AND INSTALLATION) AND/OR CSOI (POLYETHYLENE PRESSURE PIPE AND TUBING), LATEST EDITIONS, UNLESS OTHERWISE NOTED.
  - THE PIPE SHALL BE HYDROSTATICALLY TESTED BETWEEN POINTS DESIGNATED BY THE TOWN ENGINEER BY SLOWLY FILLING THE TEST SECTION WITH WATER BY CHANGING THE ELEVATION OF THE PIPE UNTIL THE PIPE HAS BEEN FULLY FILLED WITH WATER. AIR THROUGH TAPS MADE WHERE REQUIRED.
  - TEST DURATION: 30 MINUTES. TEST PRESSURE: 150% OF MAXIMUM OPERATED PRESSURE OR 100 PSI, WHICHEVER IS GREATER. ALLOW AT LEAST 2 MINUTES FOR TEMPERATURE AND PRESSURE STABILIZATION. ALLOWABLE PRESSURE LOSS SHALL NOT EXCEED MORE THAN 1 PSI FOR THE DURATION OF THE PRESSURE TEST.
  - ALLOWABLE LEAKAGE IS DETERMINED BY THE AMOUNT OF WATER REQUIRED TO RETURN THE TEST SECTION BACK TO THE STARTING PRESSURE. ALLOWABLE LEAKAGE SHALL BE DETERMINED BY THE FOLLOWING FORMULAS:



**FORCE MAIN RISER**  
NOT TO SCALE

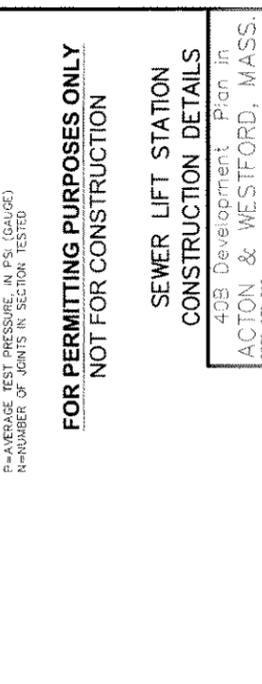
- NOTES:**
- ALLOWABLE LEAKAGE IN GALLONS PER HOUR
  - LENGTH OF PIPE TESTED IN FEET
  - DESIGN PRESSURE IN PSI
  - AVERAGE TEST PRESSURE IN PSI (GAUGE)
  - NUMBER OF JOINTS IN SECTION TESTED
- DUCTILE IRON: L = 5000 PSI PVC & HDPE: L = 1000 PSI  
 FORMULA AT 100 PSI (FOR DUCTILE IRON):  $L = 0.000275 \times S^2$   
 FORMULA AT 100 PSI (FOR PVC/HDPE):  $L = 0.000235 \times S^2$

- FOR PERMITTING PURPOSES ONLY NOT FOR CONSTRUCTION**
- SEWER LIFT STATION CONSTRUCTION DETAILS**
- 408 Development Plan in ACTION & WESTFORD, MASS.
- Woodlands at Laurel Hill, LLC  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801
- SCALE: AS SHOWN DATE: Oct. 18, 2005
- PLACES**  
 Site Consultants, Inc.  
 594 MAIN STREET SUITE 3  
 HOLDS, MA 01520-1862  
 508.829.0333 Fax 508.829.0904  
 EMAIL: places@verizon.net



**SEWER LIFT STATION**  
NOT TO SCALE

- NOTES:**
- MANHOLE COMPONENTS (BASE, SECTIONS, & CAP) SHALL BE 4,000 PSI PRECAST REINFORCED CONCRETE AND SHALL CONFORM TO ASTM C478 (PRECAST REINFORCED CONCRETE MANHOLE SECTIONS) AND CAPABLE OF WITHSTANDING AN H-20 TRUCK DESIGN LOAD.
  - ALL MANHOLE PENETRATIONS SHALL BE A MINIMUM OF SIX INCHES FROM ANY HORIZONTAL JOINT.
  - THE MANHOLE SHALL BE WATER TIGHT IN PLACE AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SEWER DEPARTMENT.
  - THE FLOW METER SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. THE MINIMUM LENGTH OF STRAIGHT PIPE (NO VALVES, FITTINGS OR OTHER OBSTRUCTIONS) BEFORE AND AFTER THE METER SHALL BE PROVIDED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
  - ELECTRICAL COMPONENTS SHALL BE INSTALLED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.



**SEWER FORCE MAIN METER PIT**  
NOT TO SCALE

ALL CONSTRUCTION MATERIALS AND METHODS SHALL MEET THE REQUIREMENTS OF THE ACTION SEWER DEPARTMENT.

**PUMP STATION AND VALVE PIT**

- CONTRACTOR SHALL PROVIDE PRE-CAST CONCRETE NET WELL WITH SUBSERSIBLE PUMP STATION EQUIPPED WITH 3490 RPM PUMPS. SEE SHEET 1 FOR SPECIFIC PUMP MODEL AND PERFORMANCE REQUIREMENTS.
- PUMPS SHALL BE MADE SPECIFICALLY FOR PUMPING RAW SEWAGE BY A MANUFACTURER WITH A REPRESENTATIVE WITH AN AUTHORIZED REPAIR SHOP/WAREHOUSE IN MA/VA/DC.
- PUMP STATION SHALL BE WARRANTED BY THE MANUFACTURER AND/OR CONTRACTOR FOR A MINIMUM OF ONE SERVICE YEAR. PROVISION FOR WARRANTY SHALL INCLUDE PARTS AND LABOR FOR ALL NECESSARY REPAIRS OTHER THAN ROUTINE PREVENTIVE MAINTENANCE OR DAMAGE DUE TO NEGLIGENCE.
- MANUFACTURERS SHALL PROVIDE SUFFICIENT REPAIR PARTS TO COMPLETE ALL ROUTINE PREVENTIVE MAINTENANCE FOR THE FIRST ONE-YEAR PERIOD.
- PUMP STATION START-UP SHALL BE PERFORMED BY A QUALIFIED MANUFACTURER'S REPRESENTATIVE, WHO SHALL DEMONSTRATE OPERATION OF ALL CONTROLS AND EQUIPMENT TO PERSONNEL FROM OWNER'S MAINTENANCE STAFF.
- A COMPLETE SET OF OPERATION AND REPAIR MANUALS SHALL BE INCLUDED WITH THE PUMP STATION.
- PUMPS SHALL BE CONSTRUCTED OF A SINGLE PIECE CAST IRON CASING AND SINGLE PIECE IMPELLER, AND SHALL CONFORM TO ASTM SPECIFICATION A48-64, CLASS 30.
- PUMP SHALL BE CAPABLE OF GRINDING SEWAGE INTO A FINE SLURRY WITHOUT BINDING OR CLOGGING THE GRINDER ASSEMBLY OR PUMP IMPELLER. THE GRINDING ASSEMBLY SHALL BE ABLE TO BE REPLACED WITHOUT DISASSEMBLING THE PUMP.
- ALL PIPING WITHIN CHAMBER SHALL BE CLASS 53 DUCTILE IRON, CEMENT LINED WITH ASPHALT COATED EXTERIOR.
- ALL FITTINGS SHALL BE FLANGED 125 LB. CAST IRON.
- DISCHARGE PIPES SHALL BE 3-INCH DUCTILE IRON WITH 125 LB. FLANGES.
- DISCHARGE PIPING SHALL BE CONNECTED TO PUMP WITH THE LIFT OUT RAIL CONNECTOR PROVIDED BY THE PUMP MANUFACTURER.
- CONTRACTOR SHALL ASCERTAIN SUITABILITY OF ON-SITE POWER. MOTORS OVER 2 HP SHALL BE 230 VOLT MINIMUM, SINGLE PHASE.
- ALL WIRING SHALL COMPLY WITH THE STATE CODE AND BE INSPECTED PRIOR TO OPERATION.
- EACH PUMP AND ALARM SHALL BE ON A SEPARATE CIRCUIT.
- PUMPS AND ALARMS SHALL BE ACTIVATED BY MECHANICAL FLOAT SWITCHES AS SHOWN IN PUMP CHAMBER DETAIL. LAG PUMP ON MAY ALSO SIGNAL ALARM.
- ALL WIRING AND ELECTRICAL EQUIPMENT LOCATED WITHIN THE NET WELL OR VALVE PIT SHALL BE CONFORM TO ALL LOCAL, STATE AND FEDERAL CODES FOR CORROSION RESISTANT AND MUST COMPLY WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (LATEST EDITION) FOR CLASS I, GROUP D, DIVISION 1 LOCATIONS.

**CONTROL PANEL**

- THE PUMP STATION CONTROL PANEL SHALL BE SUPPLIED BY THE SAME MANUFACTURER OF THE PUMPS. ALL OF THE CONTROL PANEL COMPONENTS (ALARMS, CONTROLS, ETC.) SHALL BE SUPPLIED BY THE PUMP MANUFACTURER OR COMPRISED AS A COMPLETE ASSEMBLY BY THE PUMP MANUFACTURER OR REPRESENTATIVE PRIOR TO DELIVERY TO THE SITE TO INSURE ACCOMMODATION OF ALL RELATED COMPONENTS WITH THE CONTROL PANEL.
- THE PUMPS SHALL BE OPERATED WITH A DUPLEX CONTROL SYSTEM. THE CONTROL PANEL SHALL ALTERNATE WITH EACH CYCLE.
- PUMP CONTROLS (OFF/ON) SHALL BE OPERATED BY MECHANICAL FLOAT SWITCHES IN THE NET WELL.
- EACH PUMP SHALL HAVE A THREE POSITION SWITCH WITH THE FOLLOWING: PUMP ON (AUTO CONTROL), PUMP OFF, MANUAL PUMP ON.
- THE CONTROL PANEL SHALL ALSO BE EQUIPPED WITH THE FOLLOWING OPTIONS:
  - PUMP RUN LIGHT (FOR EACH PUMP)
  - ALARM BEADON AND AUDIBLE ALARM WITH SILENCE OVERRIDE SWITCH.
  - CONSENSUS THERMISTERS FOR EACH PUMP
  - 120 VOLT/15 AMP DUPLEX CONVENIENCE OUTLET
  - PUMP CYCLE COUNTER
  - THE DELAY FOR ALARM SYSTEM
- THE PUMP CONTROL PANEL SHALL ALSO HOUSE THE FOLLOWING PUMP STATION ALARMS:
  - FLOW METER CONTROL PANEL
  - PUMP STATION ALARM (SEE BELOW FOR ALARM REQUIREMENTS)
  - AUTO DIALER
  - EMERGENCY GENERATOR CONTROL PANEL
  - SITE LIGHT BREAKER, MANUAL ON/OFF SWITCH & PHOTOMETRIC CONTROL SWITCH. SPACE FOR THE FUTURE INSTALLATION OF A LIGHT TIMER SHALL ALSO BE PROVIDED FOR IN THE CONTROL PANEL.
- THE PUMP STATION ALARMS SHALL BE OPERATED BY MECHANICAL FLOAT SWITCHES FOR LOW WATER, HIGH WATER AND HIGH-HIGH WATER. THE PUMP STATION ALARM SHALL ALSO BE ACTIVATED FOR LOSS OF POWER AND/OR PUMP FAILURE. ALL ALARMS SHALL TRIGGER THE AUTO DIALER TO CALL A TWENTY-FOUR HOUR WARRANTEE SERVICE. THE LOW WATER ALARM SHALL ALSO DISCONNECT POWER TO THE OPERATING PUMP.
- THE CONTRACTOR/SUPPLIER SHALL PROVIDE THE OWNER WITH A WIRING DIAGRAM OF THE COMPLETED CONTROL PANEL.
- THE PUMP STATION CONTROL PANEL AND RELATED CONTROLS MAY BE CONSIDERED AS TESTED AND APPROVED BY THE APPROVAL OF THE LOCAL DEPARTMENT AND THE DESIGN ENGINEER.

**FLOW METER**

- THE FLOW METER SHALL BE AN ULTRASONIC FLOW METER. THE FLOW METER MANUFACTURER AND MODEL SHALL BE APPROVED BY THE LOCAL SEWER DEPARTMENT PRIOR TO PURCHASE AND INSTALLATION.
- THE FLOW METER SHALL NOT HAVE ANY OBSTRUCTIONS IN THE FORCE MAIN OR THROUGH THE FLOW METER DEVICE.
- THE FLOW METER CONTROL PANEL SHALL BE LOCATED IN THE PUMP STATION CONTROL PANEL. THE FLOW METER CONTROL PANEL SHALL PROVIDE BOTH INCREMENTAL AND TOTAL FLOW DATA TO THE OPERATOR. THE FLOW METER SHALL BE CALIBRATED AND TESTED BY THE LOCAL SEWER DEPARTMENT TO PROVIDE ON-DEMAND READINGS IN THE FUTURE.
- THE CONTRACTOR SHALL PROVIDE THE SEWER DEPARTMENT WITH A COMPLETE OPERATORS MANUAL FOR THE OPERATION OF THE FLOW METER.
- THE FLOW METER SHALL HAVE A MINIMUM ONE YEAR WARRANTY DURING OPERATION OF THE PUMP STATION.

**CHAIN LINK FENCE**

- ALL FENCING, POSTS, GATES AND OTHER COMPONENTS SHALL BE GALVANIZED VINYL COATED - COLOR BLACK.
- ENCLOSURE FENCE SHALL HAVE A FINISH HEIGHT OF 8 FEET WITH A THREE STRAND BARR WIRE TOP FACING IN.
- BARR WIRE SHALL BE CLASS 3 ZINC COATED, GALVANIZED STEEL. THE BARR WIRE SHALL HAVE FOUR POINTS. THE BARBS SHALL BE MADE OF 14 GAUGE WIRE AND SHALL BE SPACED A MINIMUM OF 3" ON CENTER.
- CHAIN LINK FENCE FABRIC SHALL HAVE A 6 GAUGE CORE WIRE SIZE WITH 2 INCH MESH SIZE. ALL GALVANIZING AND VINYL COATING SHALL BE COMPLETED PRIOR TO THE WEAVING OF THE FENCING FABRIC. THE BOTTOM AND TOP SELVADE SHALL BE TWISTED.
- ALL STEEL PIPE FRAME WORK SHALL BE TYPE II SS-40 HOT-DIP GALVANIZED AT THE FACTORY PRIOR TO VINYL COATING. THE BASE METAL SHALL BE IN ACCORDANCE WITH ASTM A-569. PIPE MATERIALS SHALL HAVE A MINIMUM YIELD STRENGTH OF 50,000 POUNDS PER SQUARE INCH.
- TERMINAL CORNER AND PULL POSTS SHALL HAVE A 2,875 INCH OUTSIDE DIAMETER AND WEIGH A MINIMUM OF 9.11 POUNDS PER LINEAR FOOT.
- LINE POSTS SHALL HAVE A 2,375 OUTSIDE DIAMETER AND WEIGH A MINIMUM OF 3.65 POUNDS PER LINEAR FOOT.
- TOP, BOTTOM AND BRACE RAILS SHALL HAVE A 1,660 INCH OUTSIDE DIAMETER AND WEIGH A MINIMUM OF 2.27 POUNDS PER LINEAR FOOT.
- POSTS SHALL BE SPACED A MAXIMUM OF 8 FEET ON CENTER.
- ALL FENCING COMPONENTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS.
- ALL FENCING COMPONENTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS.

**CLEANING**

ALL MANHOLES, FORCE MAINS, NET WELLS AND OTHER RELATED COMPONENTS SHALL BE THOROUGHLY CLEANED OF ALL DEBRIS, AND FOREIGN MATTER OF ANY KIND, PRIOR TO FINAL INSPECTION.

**FOR PERMITTING PURPOSES ONLY  
NOT FOR CONSTRUCTION**

**SEWER LIFT STATION  
CONSTRUCTION DETAILS**

408 Development Plan in  
ACTION & WESTFORD, MASS.  
PREPARED FOR  
Woodlands at Laurel Hill, LLC  
676 ELM STREET, SUITE 300  
CONCORD, MA 01801

SCALE: AS SHOWN DATE: Oct. 19, 2025

**PLACES**  
Site Consultants, Inc.  
LANDSCAPE ARCHITECTURE CIVIL ENGINEERING SURVEYING  
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EMAIL: places@verizon.net  
PROJECT No. 04-19-25 25-46 AG. USE - 35-1

**STRUCTURES**

- THE PUMP STATION NET WELL SHALL BE OF REINFORCED CONCRETE CONSTRUCTION WITH A BITUMINOUS COATING ON THE EXTERIOR AND WATER TIGHT JOINTS. THE ENTIRE NET WELL SHALL BE WATER TIGHT WHEN ASSEMBLED. NET WELL DIMENSIONS SHALL BE AS INDICATED ON THE DRAWINGS AND PUMP STATION SCHEDULE. WITH A FORMED BOTTOM AS SHOWN ON DRAWINGS, CAPABLE OF AASHTO H520-44
- PUMP CHAMBER SHALL BE PLACED ON 12 INCHES OF 3/4" CRUSHED STONE BEDDING OVER UNDISTURBED MATERIAL OR OVER MATERIAL COMPACTED TO 95% DENSITY BY MODIFIED PROCTOR METHOD.
- ALL CONSTRUCTION JOINTS SHALL BE SEALED TO ENSURE STRUCTURE IS WATER TIGHT.
- ALL SEWER MANHOLES SHALL BE VACUUM TESTED IN ACCORDANCE WITH MASS. DEP AND LOCAL SEWER COMMISSION PROVISIONAL CRITERIA. SEE VACUUM TESTING - MANHOLES & NET WELLS ON SHEET 2 FOR TESTING REQUIREMENTS.

**FORCE MAINS**

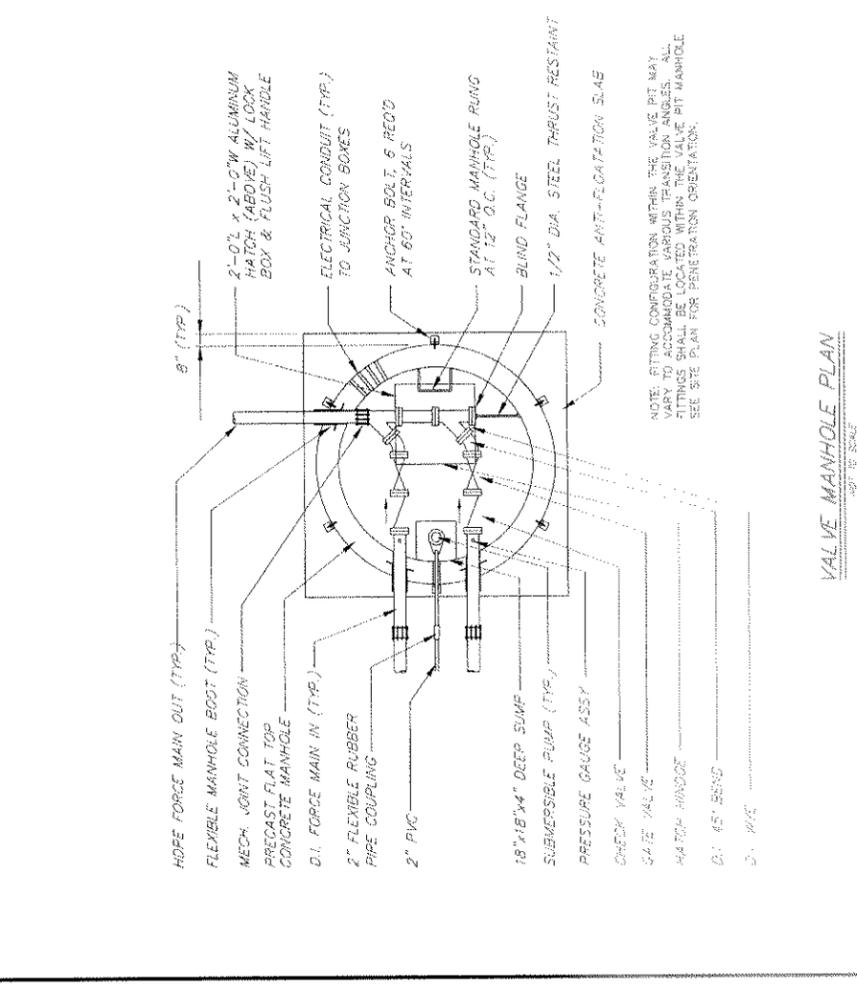
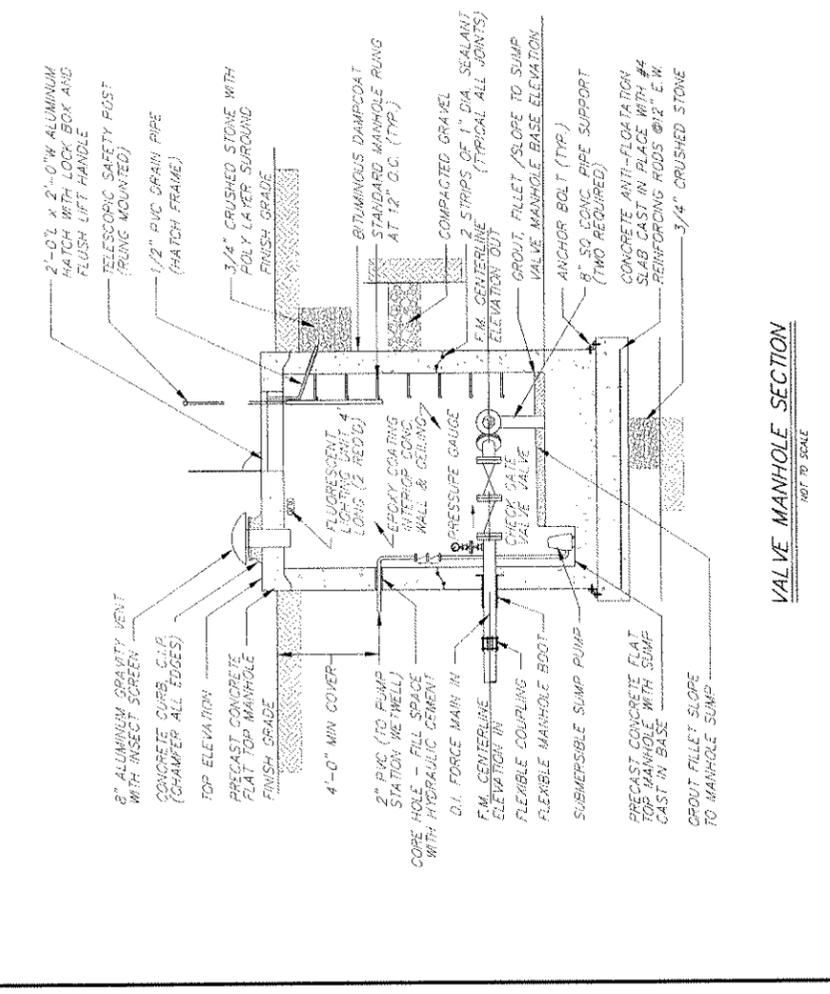
- ALL FORCE MAIN PIPING MATERIAL, INSTALLATION, AND TESTING SHALL CONFORM TO THE REQUIREMENTS OF THE SEWER COMMISSION RULES AND REGULATIONS.
- ALL FORCE MAIN PIPING SHALL CONFORM TO ASTM STANDARD SPECIFICATION D3350 FOR EXTRA HIGH MOLECULAR WEIGHT POLYETHYLENE PIPING SYSTEMS.
- FORCE MAINS SHALL HAVE A MINIMUM DIMENSION RATIO RATING OF DR-11 (60 PSI).
- ALL HIGH DENSITY POLYETHYLENE FITTINGS SHALL MATCH OR EXCEED THE PRESSURE RATING OF THE FORCE MAIN.
- ALL DUCTILE IRON FITTINGS AND VALVES SHALL MEET THE REQUIREMENTS OF THE AWWA AND SHALL HAVE A MINIMUM PRESSURE RATING OF 250 PSI WORKING PRESSURE.
- ALL PRESSURE PIPE AND FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH RECOMMENDED PRACTICE FOR THE INSTALLATION OF HIGH DENSITY POLYETHYLENE (HDPE) PRESSURE PIPE AND ALL MANUFACTURER RECOMMENDATIONS.
- TRANSITION BETWEEN PUMP STATION PIPING AND FORCE MAIN SHALL BE MADE WITH A FITTING EXPRESSLY FOR THAT PURPOSE.
- FITTINGS SHALL HAVE POURED CONCRETE THRUST BLOCKS WITH A MINIMUM BEARING AREA OF FOUR SQUARE FEET ON UNDISTURBED MATERIAL.
- JOINT DEFLECTION SHALL NOT EXCEED THAT SET FORTH BY THE MANUFACTURER.
- MAXIMUM TRENCH WIDTH SHALL BE 24 INCHES AT THE CROWN OF THE PIPE.
- MINIMUM COVER SHALL BE FIVE FEET EXCEPT NEAR STRUCTURES WHERE PIPE SHALL BE WRAPPED WITH TWO INCHES OF PRE-MOLDED RIGID POLYSTYRENE.
- INSTALLED FORCE MAIN SYSTEM SHALL BE PRESSURE TESTED TO 150 WORKING PRESSURE IN ACCORDANCE WITH RECOMMENDED PRACTICE FOR THE INSTALLATION OF HIGH DENSITY POLYETHYLENE (HDPE) PRESSURE PIPE.
- SEE PRESSURE TESTING - FORCE MAINS ON SHEET 2 FOR TESTING REQUIREMENTS AND PROCEDURES.

**AUXILIARY POWER**

- SEWER LIFT STATIONS SHALL BE EQUIPPED WITH AN EMERGENCY STAND-BY GENERATOR.
- THE GENERATORS SHALL BE POWERED BY NATURAL GAS, SUPPLIED BY THE PROPOSED GAS SERVICE FOR THE PROJECT.
- THE GENERATOR SHALL BE SIZED TO RUN THE SEWER LIFT STATION PUMPS AND ALL OTHER EQUIPMENT FOR THE PUMP STATION. THE GENERATOR SHALL BE SIZED TO PROVIDE AN ADDITIONAL 6,000 WATTS OF POWER FOR AUXILIARY USE.
- THE GENERATOR SHALL BE EQUIPPED WITH AN AUTOMATIC START AND TRANSFER SWITCH FOR POWER LOSS. THE GENERATOR CONTROL PANEL SHALL BE LOCATED WITHIN THE PUMP STATION CONTROL PANEL.
- THE GENERATOR SHALL BE HOUSED IN A WEATHER PROOF, LOCKING, SOUND DAMPENING ENCLOSURE TO MINIMIZE VANDALISM AND OPERATING NOISE.
- THE GENERATOR SHALL BE PLACED ON A 6" THICK REINFORCED CONCRETE PAD AND SECURED TO THE PAD WITH ANCHOR BOLTS.

**ANTI-FLOATATION SLAB**

NOTE: FITTING CONFIGURATION WITHIN THE VALVE PIT MAY VARY TO ACCOMMODATE VARIOUS TRANSITION ANGLES. ALL FITTINGS SHALL BE LOCATED WITHIN THE VALVE PIT MANHOLE. SEE SITE PLAN FOR PENETRATION ORIENTATION.



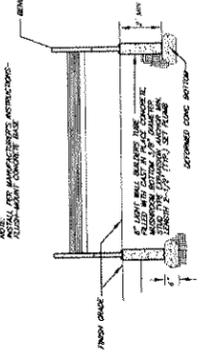
**VALVE MANHOLE PLAN**

NOTE: FITTING CONFIGURATION WITHIN THE VALVE PIT MAY VARY TO ACCOMMODATE VARIOUS TRANSITION ANGLES. ALL FITTINGS SHALL BE LOCATED WITHIN THE VALVE PIT MANHOLE. SEE SITE PLAN FOR PENETRATION ORIENTATION.

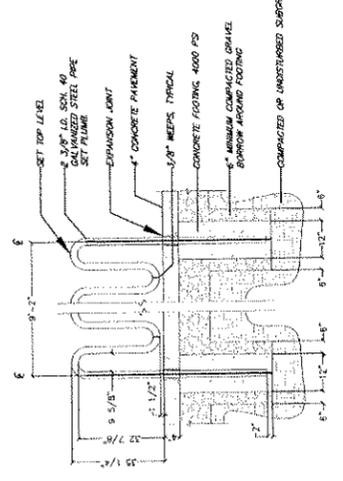
ALL CONSTRUCTION MATERIALS AND METHODS SHALL MEET THE REQUIREMENTS OF THE ACTION SEWER DEPARTMENT.

SIGN	LEGEND	DIMENSIONS	SPECIFICATIONS
	R1-1	24" OCTAGONAL	MUTCD
	R5-1	24"	MUTCD
	R2-1	18" X 24"	MUTCD
	R2-1	18" X 24"	MUTCD
	R7-1	12" X 18"	MUTCD
	R7-6	12" X 18"	MUTCD
	A1-10	24" X 8"	N/A
	R7-8	12" X 18"	MUTCD
	R7-8B	12" X 6"	MUTCD

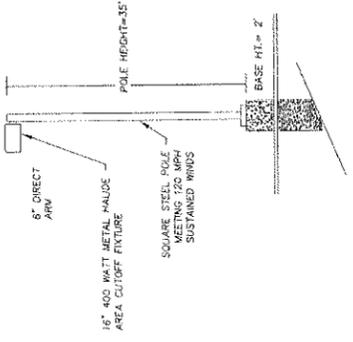
**SIGN SCHEDULE**  
NOT TO SCALE



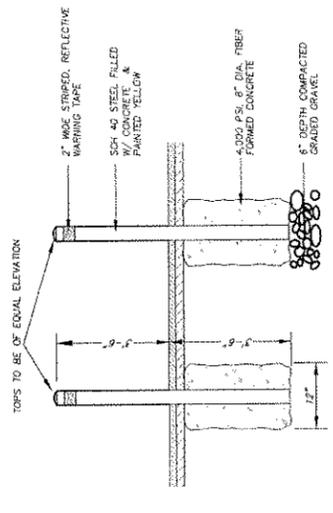
**BENCH ANCHORING DETAIL**  
NOT TO SCALE



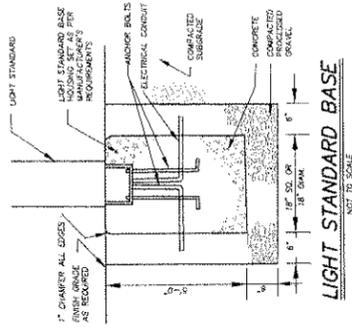
**BIKE RACK**  
NOT TO SCALE



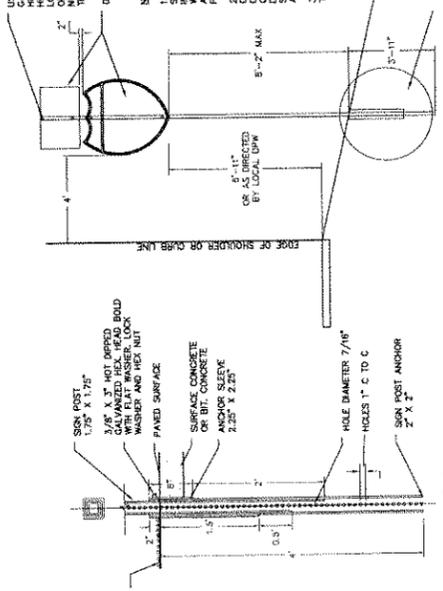
**ROADWAY/PARKING AREA LIGHT**  
NOT TO SCALE



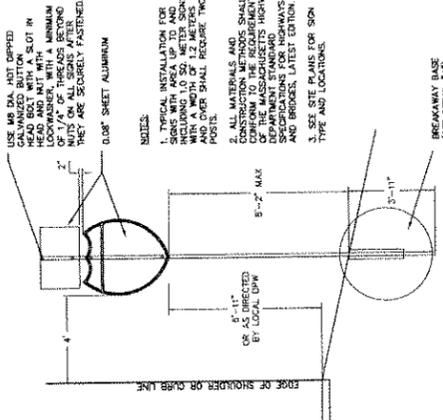
**BOLLARD GUARD**  
NOT TO SCALE



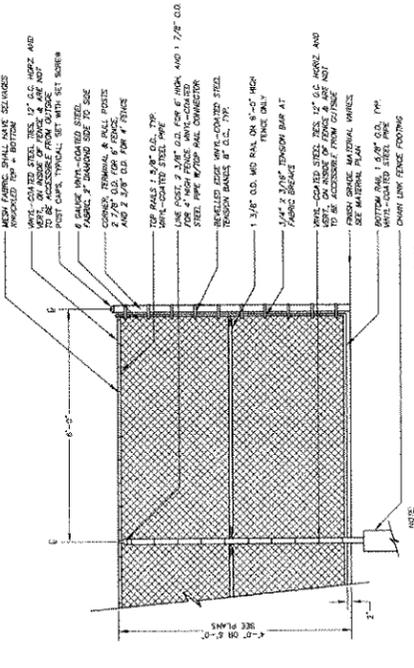
**LIGHT STANDARD BASE**  
NOT TO SCALE



**DETAIL 'A' BREAKAWAY BASE**

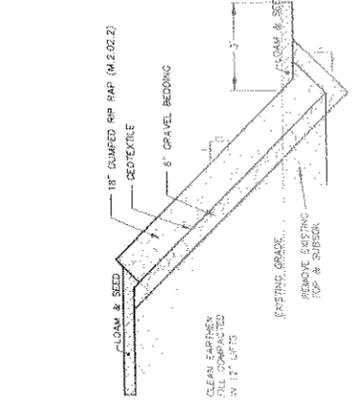


**TYPICAL SIGN**  
NOT TO SCALE

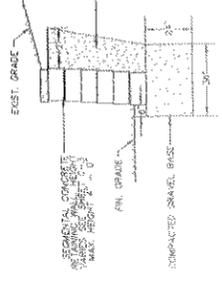


**4' OR 6' HT. CHAIN LINK FENCE**  
NOT TO SCALE

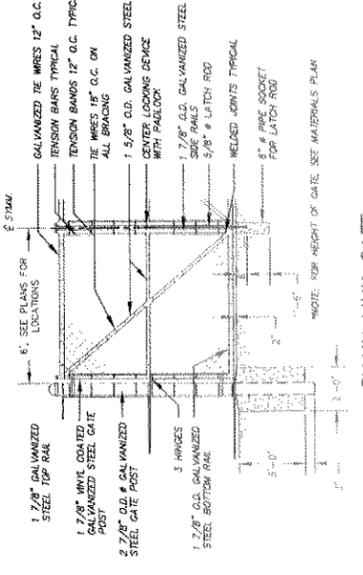
FOR USE WHERE SHOWN AND AT TOPS OF RETAINING WALLS GREATER THAN 4' IN HEIGHT



**RIP RAP STABILIZED SLOPE**  
NOT TO SCALE



**SEGMENTAL UNIT RETAINING WALL**  
NOT TO SCALE



**CHAIN LINK GATE**  
NOT TO SCALE

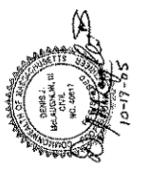
NOTE: FOR HEIGHT OF GATE, SEE MATERIALS PLAN

**CONSTRUCTION DETAILS & SITE IMPROVEMENTS**

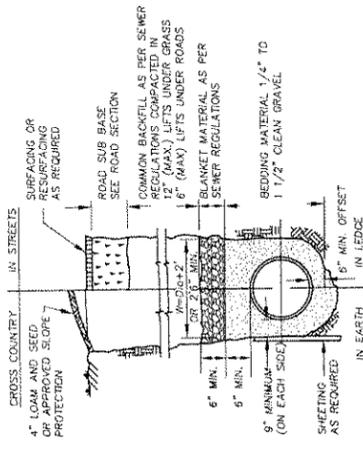
40B Development Plan in  
ACTON & WESTFORD, MASS.  
Woodlands at Laurel Hill, LLC  
676 ELM STREET, SUITE 300  
CONCORD, MA 01801

SCALE: AS SHOWN DATE October 19, 2005

**PLACES**  
Site Consultants, Inc.  
PLANNING, LANDSCAPE ARCHITECTURE, CIVIL ENGINEERING, SURVEYING  
694 MAIN STREET, SUITE 3  
HOLDEN, MA 01520-1862  
508.829.0333 Fax 508.829.0904  
EMAIL: places@entnet.net  
PROJECT #6: 04-135

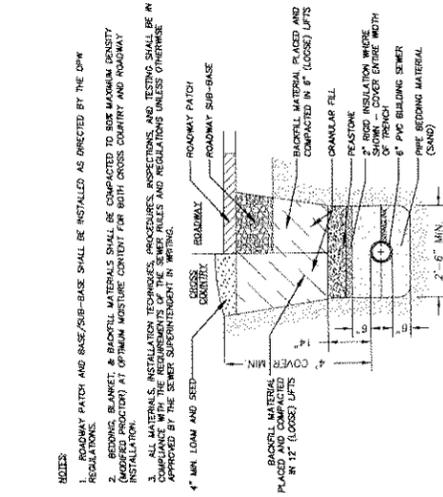


**FOR PERMITTING PURPOSES ONLY**  
NOT FOR CONSTRUCTION

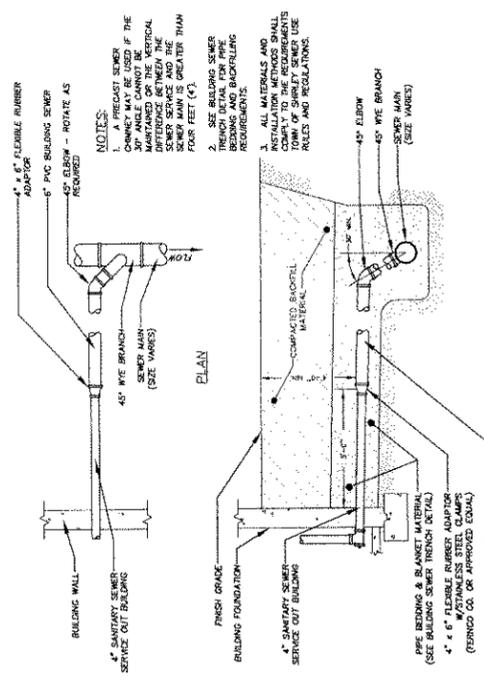


NOTE:  
 1. BOTH THE BEDDING AND BLANKET MATERIAL SHALL BE COMPACTED IN 6" LOOSE LIFTS TO 80% MAXIMUM DRY DENSITY PER THE MODIFIED PROCTOR TEST.  
 2. ALL UNSUITABLE MATERIAL SHALL BE REMOVED AND REPLACED WITH GRAVEL OR OTHER SUITABLE MATERIAL COMPACTED TO 80% MAXIMUM DENSITY (MODIFIED PROCTOR).

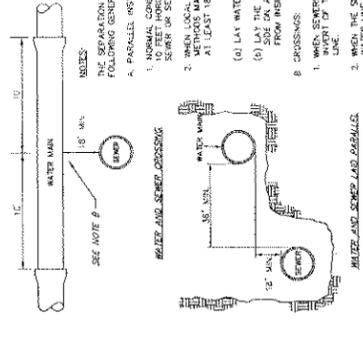
**TYPICAL SEWER TRENCH**  
NOT TO SCALE



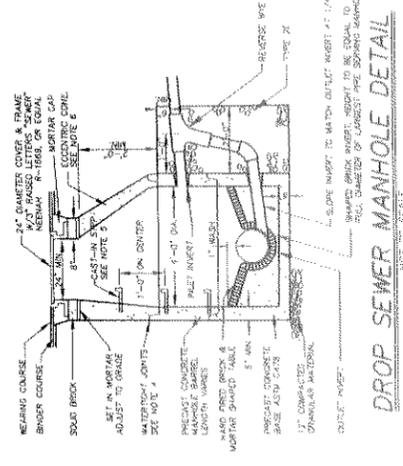
**BUILDING SEWER TRENCH**  
NOT TO SCALE



**BUILDING SEWER CONNECTION**  
NOT TO SCALE

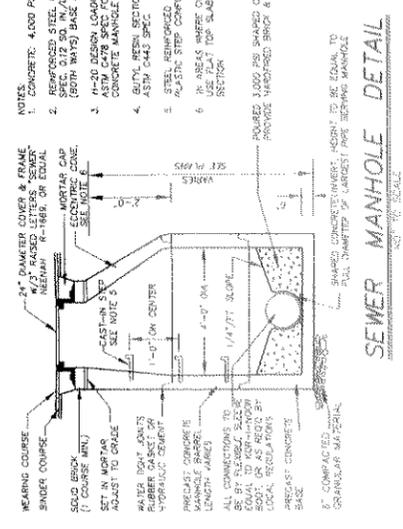


**SEWER AND WATER IN SAME TRENCH/CROSSING**  
NOT TO SCALE



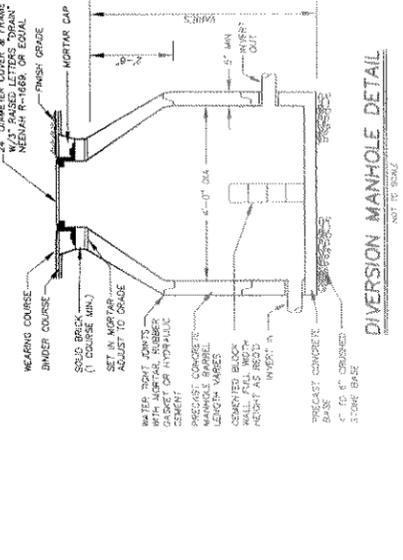
FOR BOTH MANHOLE TYPES NOTES:  
 1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.  
 2. REINFORCED STEEL CONFORMS TO LATEST ASTM A185 SPEC. 0.12 50 IN./L INCHAL FT. AND 0.12 50 IN. (BOTH WAYS) BASE BOTTOM.  
 3. #1-20 DIVISION LANDING PIPE ASTM A53-D1-44. (BOTH WAYS) BASE BOTTOM. PREPARED CONCRETE MANHOLE SECTIONS.  
 4. 4\"/>

**DROP SEWER MANHOLE DETAIL**  
NOT TO SCALE



NOTES:  
 1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.  
 2. REINFORCED STEEL CONFORMS TO LATEST ASTM A185 SPEC. 0.12 50 IN./L INCHAL FT. AND 0.12 50 IN. (BOTH WAYS) BASE BOTTOM.  
 3. #1-20 DIVISION LANDING PIPE ASTM A53-D1-44. (BOTH WAYS) BASE BOTTOM. PREPARED CONCRETE MANHOLE SECTIONS.  
 4. 4\"/>

**SEWER MANHOLE DETAIL**  
NOT TO SCALE



**DIVERSION MANHOLE DETAIL**  
NOT TO SCALE



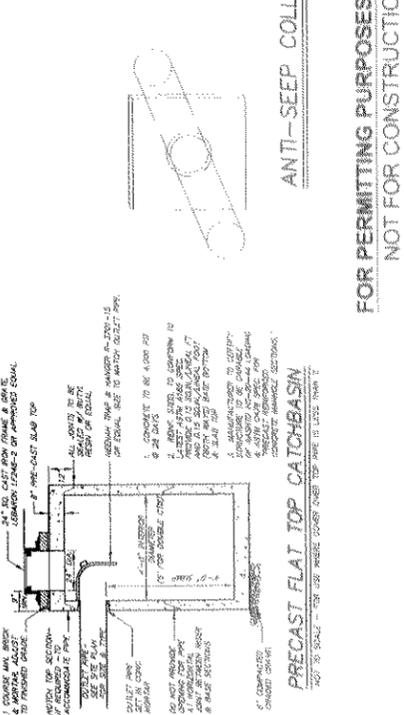
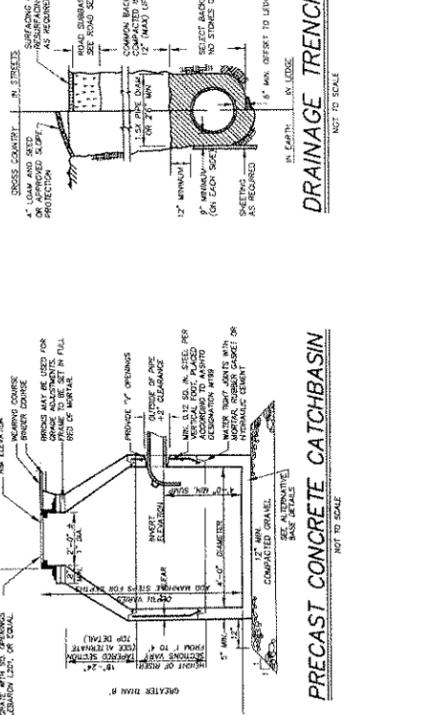
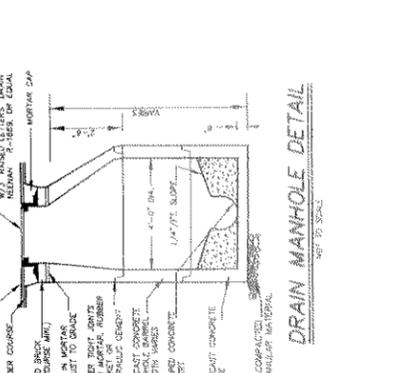
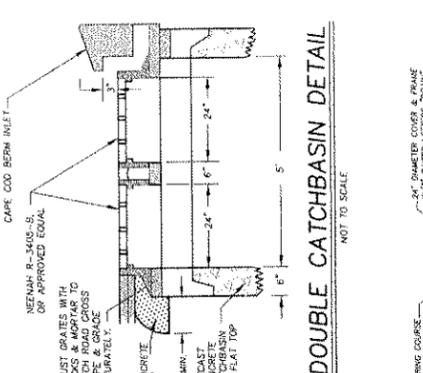
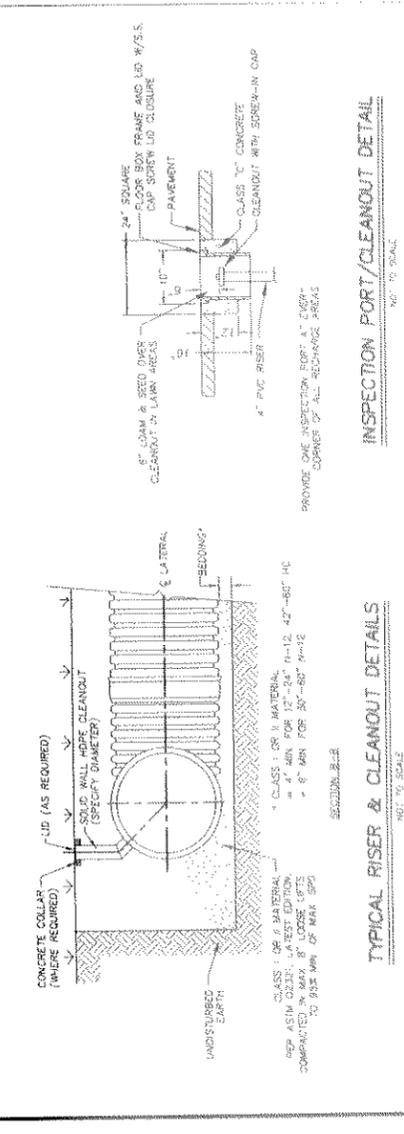
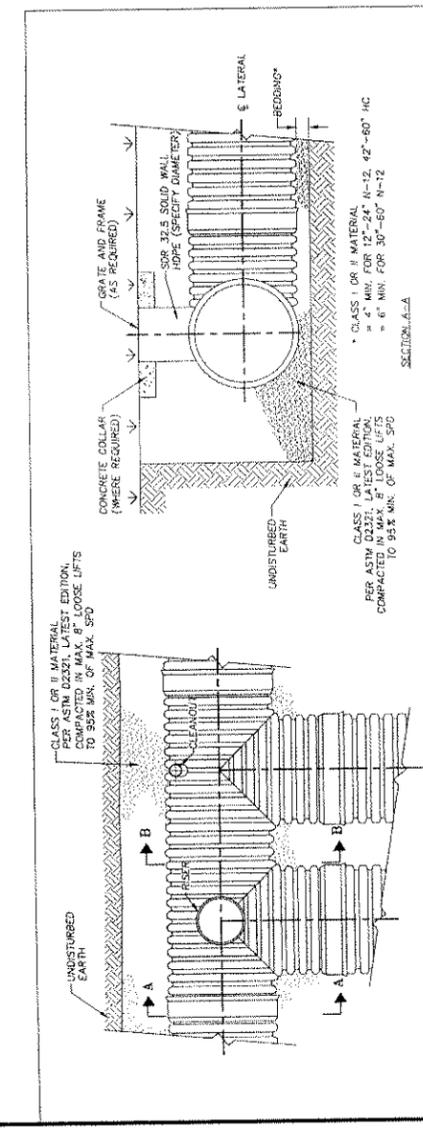
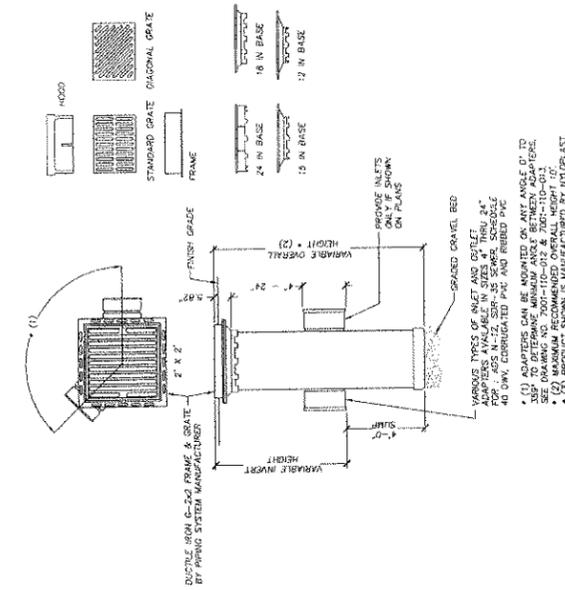
**SEWER DETAILS**  
 40B Development Plan in  
**ACTION & WESTFORD, MASS.**  
 PREPARED FOR:  
**Woodlands at Laurel Hill, LLC**  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801  
 SCALE: AS SHOWN DATE: October 19, 2005

**PLACES**  
 Site Consultants, Inc.  
 PLANNING LANDSCAPE ARCHITECTURE CIVIL ENGINEERING SURVEYING  
 694 MAIN STREET, SUITE 3  
 HOLDEN, MA 01520-1862  
 508.829.0333 FAX 508.829.0904  
 EMAIL places@verizon.net  
 PROJECT No. 04-13C

**FOR PERMITTING PURPOSES ONLY**  
**NOT FOR CONSTRUCTION**

BASIN	Vertical Offsets		Horizontal Offsets		Cover/Water		Cover/Flow		Drainage Pipe	
	Number	Diameter	Invert Elev.	Elev.	Width	Elevation	Top	Water	Length	Slope
A	1	6"	262.25	263.25	10	263.00	264.5	265.00	300	0.006
	3	4"	262.75	263.25	10	263.00	264.5	265.00	300	0.006
B	2	12"	260.75	261.00	10	260.75	261.5	262.00	50	0.010
	3	6"	260.00	260.75	4	260.25	260.5	260.75	25	0.000
C	2	12"	258.00	258.50	10	258.00	258.5	259.00	50	0.010
	3	6"	257.50	258.00	10	257.50	258.00	258.50	50	0.010
D	1	12"	255.50	256.00	10	255.50	256.00	256.50	35	0.003
	3	6"	255.00	255.50	10	255.00	255.50	256.00	35	0.003
E	2	7"	252.25	253.40	10	252.25	253.40	254.15	42	0.000
	3	4"	252.75	253.40	10	252.75	253.40	254.15	42	0.000
F	2	6"	250.00	250.00	10	250.00	250.00	250.00	50	0.000
	3	4"	250.00	250.00	10	250.00	250.00	250.00	50	0.000
G	2	6"	248.00	248.00	10	248.00	248.00	248.00	50	0.000
	3	4"	248.00	248.00	10	248.00	248.00	248.00	50	0.000
H	2	6"	246.00	246.00	10	246.00	246.00	246.00	50	0.000
	3	4"	246.00	246.00	10	246.00	246.00	246.00	50	0.000
I	2	6"	244.00	244.00	10	244.00	244.00	244.00	50	0.000
	3	4"	244.00	244.00	10	244.00	244.00	244.00	50	0.000
J	2	6"	242.00	242.00	10	242.00	242.00	242.00	50	0.000
	3	4"	242.00	242.00	10	242.00	242.00	242.00	50	0.000
K	2	6"	240.00	240.00	10	240.00	240.00	240.00	50	0.000
	3	4"	240.00	240.00	10	240.00	240.00	240.00	50	0.000
L	2	6"	238.00	238.00	10	238.00	238.00	238.00	50	0.000
	3	4"	238.00	238.00	10	238.00	238.00	238.00	50	0.000
M	2	13"	223.00	225.00	10	223.00	225.00	226.50	48	0.020
	3	6"	226.00	226.00	10	226.00	226.00	226.50	48	0.020
N	2	4"	217.00	218.00	10	217.00	218.00	219.50	27	0.019
	3	6"	216.00	216.00	10	216.00	216.00	216.50	27	0.019
O	2	6"	208.00	208.00	10	208.00	208.00	208.50	65	0.002
	3	4"	208.00	208.00	10	208.00	208.00	208.50	65	0.002
P	2	6"	203.00	203.00	10	203.00	203.00	203.50	40	0.050
	3	6"	203.00	203.00	10	203.00	203.00	203.50	40	0.050
Q	2	6"	197.25	197.25	10	197.25	197.25	197.50	257	0.060
	3	6"	197.25	197.25	10	197.25	197.25	197.50	257	0.060
R	2	6"	195.00	195.00	10	195.00	195.00	195.50	135	0.037
	3	6"	195.00	195.00	10	195.00	195.00	195.50	135	0.037
S	2	6"	193.5	193.5	10	193.5	193.5	194.00	80	0.020
	3	4"	193.5	193.5	10	193.5	193.5	194.00	80	0.020

BASIN	Vertical Offsets		Horizontal Offsets		Cover/Water		Cover/Flow		Drainage Pipe	
	Number	Diameter	Invert Elev.	Elev.	Width	Elevation	Top	Water	Length	Slope
M	2	13"	223.00	225.00	10	223.00	225.00	226.50	48	0.020
	3	6"	226.00	226.00	10	226.00	226.00	226.50	48	0.020
N	2	4"	217.00	218.00	10	217.00	218.00	219.50	27	0.019
	3	6"	216.00	216.00	10	216.00	216.00	216.50	27	0.019
O	2	6"	208.00	208.00	10	208.00	208.00	208.50	65	0.002
	3	4"	208.00	208.00	10	208.00	208.00	208.50	65	0.002
P	2	6"	203.00	203.00	10	203.00	203.00	203.50	40	0.050
	3	6"	203.00	203.00	10	203.00	203.00	203.50	40	0.050
Q	2	6"	197.25	197.25	10	197.25	197.25	197.50	257	0.060
	3	6"	197.25	197.25	10	197.25	197.25	197.50	257	0.060
R	2	6"	195.00	195.00	10	195.00	195.00	195.50	135	0.037
	3	6"	195.00	195.00	10	195.00	195.00	195.50	135	0.037
S	2	6"	193.5	193.5	10	193.5	193.5	194.00	80	0.020
	3	4"	193.5	193.5	10	193.5	193.5	194.00	80	0.020



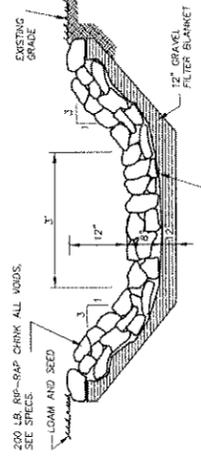
**DRAINAGE DETAILS**  
40B Development Plan in  
ACTON & WESTFORD, MASS.  
PREPARED FOR:  
**Woodlands at Laurel Hill, LLC**  
676 ELM STREET, SUITE 300  
CONCORD, MA 01801  
SCALE: AS SHOWN DATE: October 19, 2005

**PLACES**  
Site Consultants, Inc.  
694 MAIN STREET, SUITE 3  
HOLDEN, MA 01520-1892  
508.829.0399 Fax 508.829.0904  
EMAIL: places@verizon.net  
PROJECT No. 04-038  
DRAWING No. 04-038-01-1

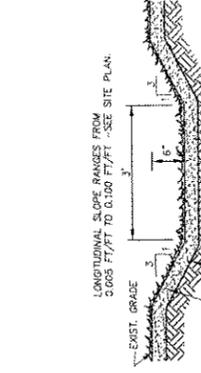
**FOR PERMITTING PURPOSES ONLY**  
NOT FOR CONSTRUCTION

**200 LB. RIP-RAP SPECIFICATIONS:**

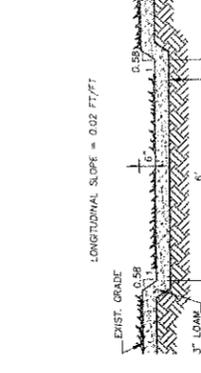
1. ALL STONE SHALL BE CLEAN, Durable, Angular Stone Meeting The Following Specifications:  
 STONE SIZE 2 OF WEIGHT SMALLER THAN GIVEN SIZE  
 100 LB 75%  
 75 LB 90%  
 50 LB 95%  
 25 LB 100%  
 10 LB 100%  
 5 LB 100%  
 2. THE RIP-RAP SHALL BE UNDERLAIN WITH A FILTER BLANKET CONSISTING OF CLEAN, COARSE GRAVEL WITH NO STONES OVER 4" IN LONGEST DIMENSION AND NO FEWER THAN 10% OF TOTAL VOLUME PASSING A 200# SIEVE.  
 3. THE FILTER BLANKET NEED NOT BE COMPACTED, BUT SHALL BE GRADED TO A UNIFORM THICKNESS OF 12".  
 4. THE FILTER BLANKET SHALL BE OVERLAIN WITH AN EROSION CONTROL FABRIC EQUAL TO MFRAP 700X. EROSION CONTROL FABRIC SHALL BE CONTINUOUS IN LENGTHS, EITHER PARALLEL OR PERPENDICULAR TO THE SLOPE AND MUST BE UNDER ALL RIP-RAPPED SURFACES.



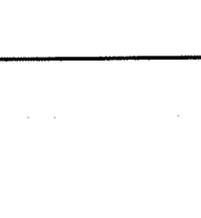
**REINFORCED RIP-RAP SWALE**  
 NOT TO SCALE



**GRASSED SWALE**  
 NOT TO SCALE



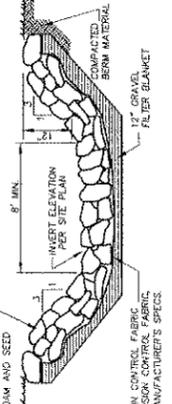
**GRASSED SWALE**  
 NOT TO SCALE



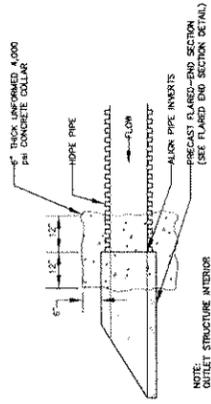
**GRASSED SWALE**  
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**REINFORCED OVERFLOW BROAD-CRESTED WEIR**

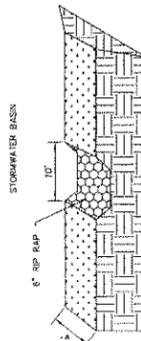
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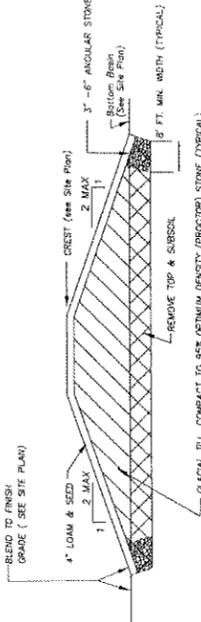
**REINFORCED OVERFLOW BROAD-CRESTED WEIR**  
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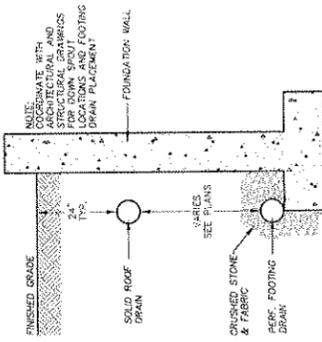
**FLARED END SECTION / HDPE PIPE CONNECTION**  
 NOT TO SCALE



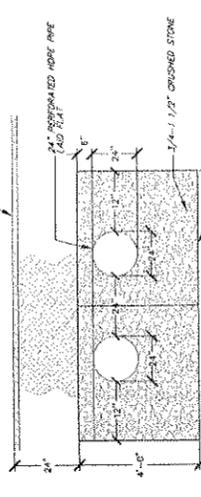
**FOREBAY OVERFLOW**  
 NOT TO SCALE



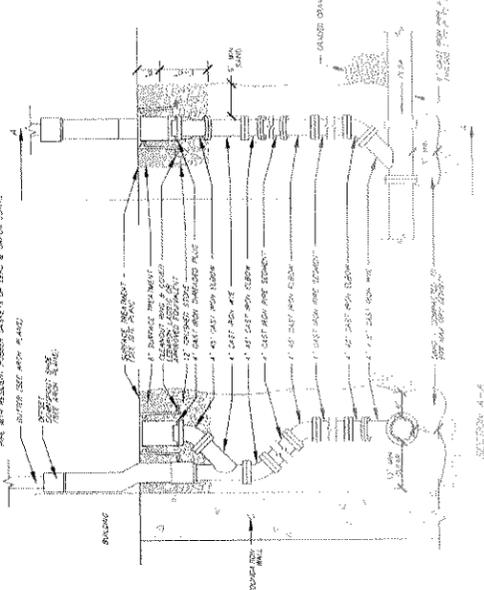
**STORMWATER BASIN LINER/DIKE DETAIL**  
 NOT TO SCALE



**TYPICAL ROOF FOOTING DRAIN CROSS SECTION**  
 NOT TO SCALE



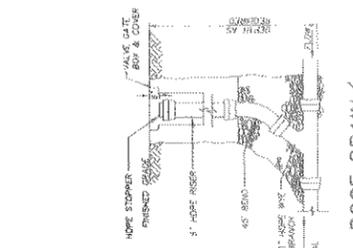
**ROOF DRAIN RECHARGE TRENCH**  
 NOT TO SCALE



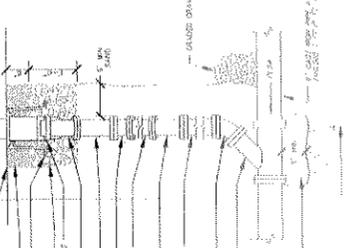
**ROOF DRAIN CONNECTION**  
 NOT TO SCALE



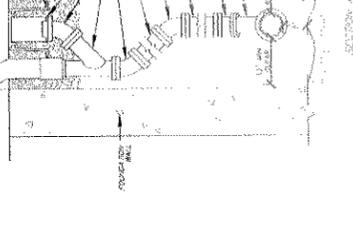
**STORMWATER BASIN LINER/DIKE DETAIL**  
 NOT TO SCALE



**ROOF DRAIN / CLEANOUT**  
 NOT TO SCALE



**ROOF DRAIN CONNECTION**  
 NOT TO SCALE



**ROOF DRAIN CONNECTION**  
 NOT TO SCALE



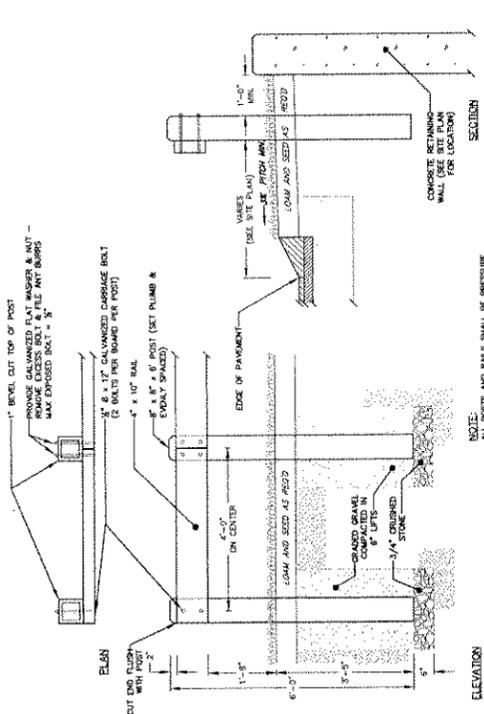
**ROOF DRAIN CONNECTION**  
 NOT TO SCALE

**DRAINAGE DETAILS**  
 40B Development Plan in  
 ACTON & WESTFORD, MASS.  
 PREPARED FOR:  
**Woodlands at Laurel Hill, LLC**  
 676 ELM STREET, SUITE 300  
 CONCORD, MA 01801  
 SCALE: AS SHOWN DATE: October 19, 2005

**PLACES**  
 Site Consultants, Inc.  
 PLANNING LANDSCAPE ARCHITECTURE CIVIL ENGINEERING SURVEYING  
 694 MAIN STREET, SUITE 3  
 HOLDEN, MA 01526-1882  
 508.829.0333 Fax 508.829.0994  
 EMAIL: places@verizon.net  
 REG. NO. 05-14-13E P-046-00-330-0-1

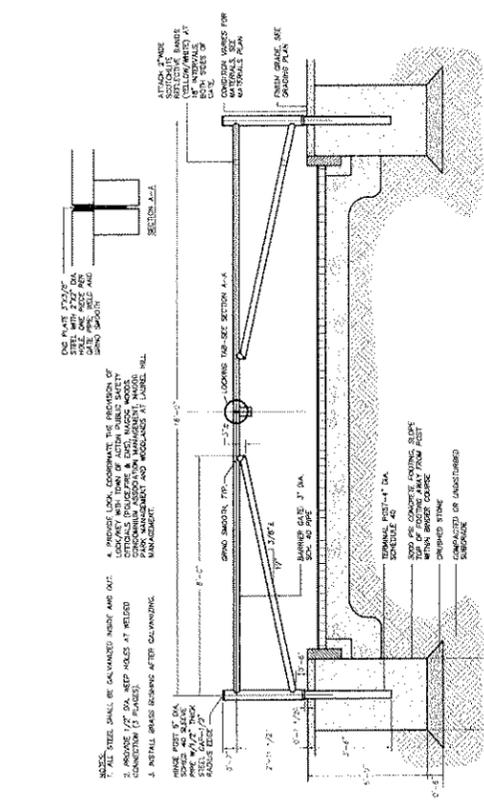


**FOR PERMITTING PURPOSES ONLY**  
 NOT FOR CONSTRUCTION

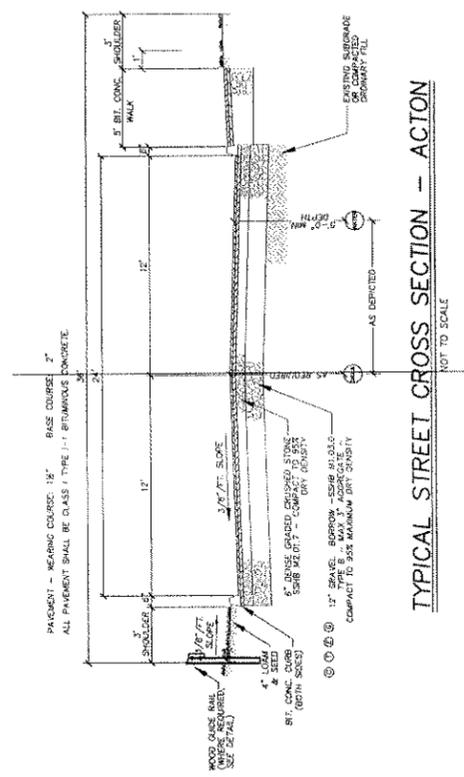


**WOOD GUIDE RAIL**  
NOT TO SCALE

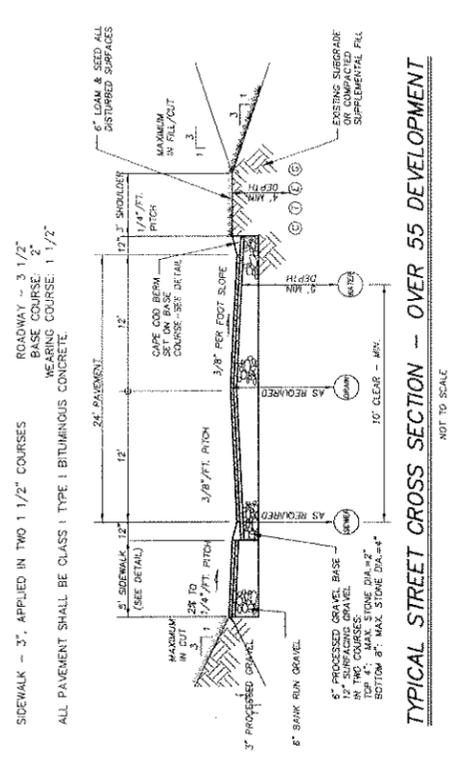
NOTE: ALL POSTS AND RAILS SHALL BE PRESSURE TREATED DOUGLAS FIR OR SOUTHERN YELLOW PINE TREATED TO A MINIMUM OF 0.50 GRAIN.



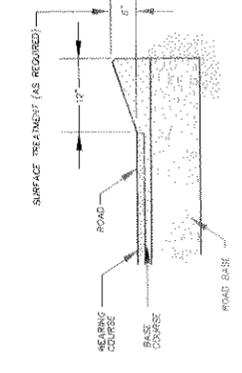
**VEHICULAR BARRIER GATE**  
NOT TO SCALE



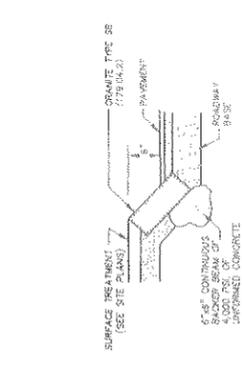
**TYPICAL STREET CROSS SECTION - ACTON**  
NOT TO SCALE



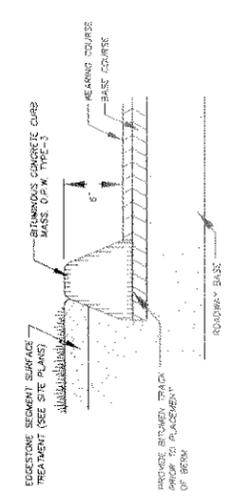
**TYPICAL STREET CROSS SECTION - OVER 55 DEVELOPMENT**  
NOT TO SCALE



**CAPE COD BERM**  
NOT TO SCALE



**SLOPED GRANITE CURB**  
NOT TO SCALE



**BITUMINOUS CONCRETE CURB**  
NOT TO SCALE

REGULATORY CURB USED WHERE OTHERS ARE NOT SPECIFIED

USED ONLY AT JUNCTION OF ACCESS ROADS AT WOODS PARK ROAD AND WESTFORD JANE CURB FLARES

USED AGAINST 8 FT CONC WALK IN LAUREL HILL DRIVE ONLY



**CONSTRUCTION DETAILS & SITE IMPROVEMENTS**

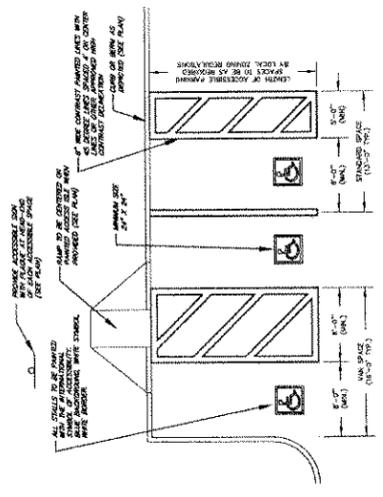
40B Development Plan in ACTON & WESTFORD, MASS. PREPARED FOR: Woodlands at Laurel Hill, LLC 676 ELM STREET, SUITE 300 CONCORD, MA 01801

SCALE: AS SHOWN DATE: October 19, 2005

**PLACES**  
Site Consultants, Inc.  
PLANNING, ARCHITECTURE, INTERIOR DESIGN, ENGINEERING, SURVEYING

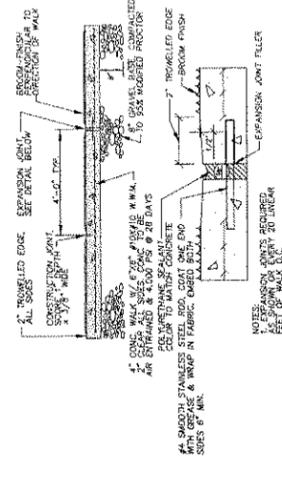
654 MAIN STREET, SUITE 3 HOLDEN, MA 01530-1982  
508.829.0323 Fax 508.829.0904  
EMAIL: places@verizon.net  
PROJECT No. 24-14-14K P-446 no. 101-25

**FOR PERMITTING PURPOSES ONLY**  
NOT FOR CONSTRUCTION

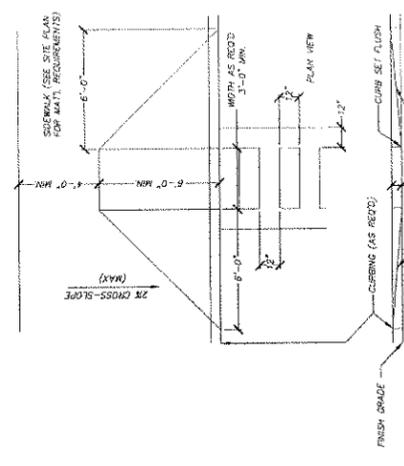


- NOTES:**
- 1) PARKING SPACES SHALL MEET THE REQUIREMENTS OF THE AMERICAN WITH PHYSICALLY HANDICAPPED ARCHITECTURAL ACCESS BOARD - 2010.
  - 2) PARKING SPACES AND ACCESS ISLES SHALL BE LINED WITH SURFACE SLOPES NOT EXCEEDING 1:50 (2%) IN ALL DIRECTIONS.
  - 3) ACCESS ISLES ADJACENT TO ACCESSIBLE PARKING SPACES SHALL BE 5'-0" WIDE MINIMUM EXCEPT WHERE SHOWN OTHERWISE. MINIMUM WIDTH SHALL BE A MINIMUM 8'-0" WIDE MINIMUM. A MINIMUM OF ONE VAN SPACE SHALL BE PROVIDED PER SITE.
  - 4) TWO ACCESSIBLE SPACES MAY SHARE A COMMON ACCESS ISLE.
  - 5) A SIGN IDENTIFYING ACCESSIBLE PARKING SPACES SHALL BE PROVIDED AND SHALL BE 10'-0" HIGH. THE SIGN SHALL BE AS SPECIFIED BY THE MANUAL OF UNIFORM PRACTICE (MUTID), 417-6 ON APPROVED TYPICAL.
  - 6) WIDTH OF THE CURB OF VAN ACCESSIBLE SPACES SHALL INCLUDE THE WHEEL WEAIR ACCESSIBLE MUTID 417-6B OR APPROVED EQUAL.

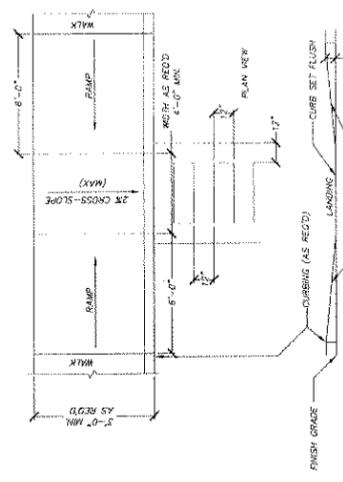
**ACCESSIBLE PARKING SPACES**  
NOT TO SCALE



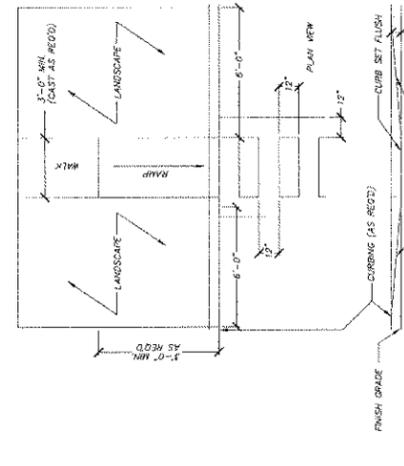
**CONCRETE WALK & PADS**  
NOT TO SCALE



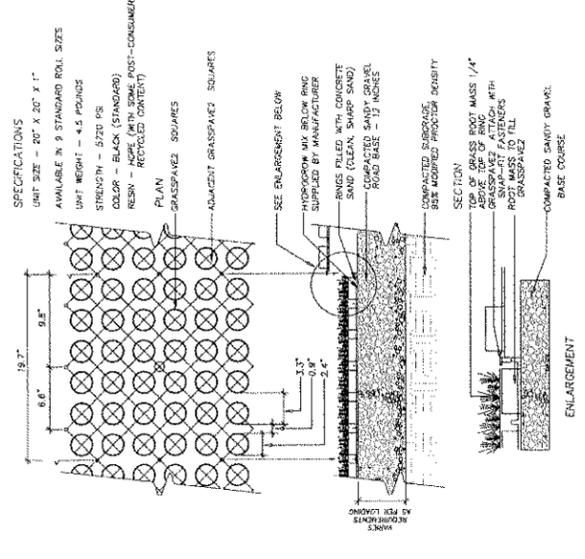
**TYPE 1 ACCESSIBLE RAMP (AR-1)**  
NOT TO SCALE



**TYPE 2 ACCESSIBLE RAMP (AR-2)**  
NOT TO SCALE



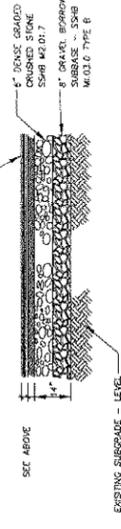
**TYPE 3 ACCESSIBLE RAMP (AR-3)**  
NOT TO SCALE



**TYPICAL GRASSPAVE2 DETAIL**  
NOT TO SCALE

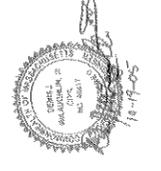
**STABILIZED LAWN**

**BITUMINOUS CONC. WALKWAY, DRIVE & PARKING**  
NOT TO SCALE



- SPECIFICATIONS**
- UNIT SIZE - 20' X 20' X 1"
- AVAILABLE IN 9 STANDARD ROL SIZES
- UNIT HEIGHT - 4.5 POUNDS
- STRENGTH - 5720 PS
- COLOR - BLACK (STANDARD)
- RESIN - HDPE (WITH SOME POST-CONSUMER RECYCLED CONTENT)
- PLAN
- GRASSPAVE2 SQUARES
- ADJACENT GRASSPAVE2 SQUARES

- NOTES:**
1. GRASS/PLANT TYPES SHALL BE SPECIFIED BY A LANDSCAPE ARCHITECT
  2. AN EQUAL SYSTEM MAY BE SUBSTITUTED IF APPROVED BY DESIGN ENGINEER.



**FOR PERMITTING PURPOSES ONLY**  
NOT FOR CONSTRUCTION

**CONSTRUCTION DETAILS & SITE IMPROVEMENTS**

40B Development Plan in  
**ACTION & WESTFORD, MASS.**  
PREPARED FOR:  
**Woodlands at Laurel Hill, LLC**  
676 ELM STREET, SUITE 300  
CONCORD, MA 01801

SCALE: AS SHOWN DATE: October 19, 2005

**PLACES**  
**Site Consultants, Inc.**  
LANDSCAPE ARCHITECTURE CIVIL ENGINEERING ARCHITECTING  
694 MAIN STREET, SUITE 3  
HOLDEN, MA 01520-1062  
508.829.0393 Fax 508.829.0904  
EMAIL: places@verizon.net  
PROJECT NO.: 05-115

# STORMWATER POLLUTION PREVENTION PLAN

## GENERAL:

1. THIS PLAN IS ALSO INTENDED TO PROVIDE GUIDANCE AND INSTRUCTION TO THE OWNER AND CONTRACTOR IN THE PREVENTION OF ANY PERMIT CONDITIONS OR ORDERS OF CONDITIONS TO BE MORE SPECIFIC IN ADDRESSING ITEMS OF CONCERN. IF, UPON ISSUANCE OF A COMPLIANCE PERMIT FROM THE ACTION BOARD, THE CONTRACTOR IS ADVISED THAT THE PREVENTION PLAN DOES NOT MEET THE PERMIT CONDITIONS, THE CONTRACTOR SHALL SUPPLEMENT THE PREVENTION PLAN WITH THE NECESSARY CHANGES TO BRING THE PLAN INTO COMPLIANCE WITH THE PERMIT CONDITIONS.
2. THIS PLAN IS PART OF A SET OF DOCUMENTS THAT ARE TO BE VIEWED AND REVIEWED IN THEIR ENTIRETY, SUCH DOCUMENTS INCLUDE THE CONSTRUCTION WORK PERMIT, THE TOWN OF ACTON OR OTHER REGULATORY AGENCIES.

## EROSION CONTROL MEASURES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT EROSION AND SEDIMENTATION ARE CONTROLLED. WEATHER CONDITIONS, AND ANY PERMIT CONDITIONS, ORDERS OF CONDITIONS, AND ANY OTHER REGULATORY AGENCIES SHALL BE TAKEN INTO ACCOUNT. THESE FUNDAMENTAL PRINCIPLES SHALL BE THE KEY FACTOR IN THE CONTRACTOR'S CONTROL OF EROSION ON THE SITE.
2. THE EXISTING SOIL CONDITIONS PROVIDE THE POTENTIAL OF RUNOFF TO OFF-SITE AREAS WITH EROSION POTENTIAL.
3. THE CONTRACTOR SHALL CONSTRUCT TEMPORARY DIVERSION SWALES AND SETTLING BASINS IN AREAS OF FUTURE CONSTRUCTION. CONSTRUCTION IS PERMITTED TO PROCEED ONLY AFTER THE EROSION CONTROL MEASURES HAVE BEEN INSTALLED AND APPROVED BY THE ACTION BOARD. MEASURES ARE REQUIRED, AND SHALL BE SUBJECT TO APPROVAL BY THE ACTION BOARD, TO MAINTAIN THE LIMIT OF DISTURBANCE LINE SHALL BE THE EROSION CONTROL BARRIERS.
4. UNLESS OTHERWISE SPECIFIED, THE SITE SHALL BE CLEARED OR IS TEMPORARILY LIMITED CONSTRUCTION IN ANY PORTION OF THE SITE AS CLEARED OR IS TEMPORARILY LIMITED CONSTRUCTION IS INTENDED TO BE INITIATED WITHIN 21 DAYS.
5. THE CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE AND REPAIR OF ALL EROSION CONTROL DEVICES ON-SITE. ALL EROSION CONTROL DEVICES SHALL BE REGULARLY INSPECTED AND MAINTAINED TO ENSURE THEY REMAIN EFFECTIVE. DEVICES DEPOSED OF OUTSIDE OF THE 100' WETLANDS BUFFER ZONE.
6. AT NO TIME SHALL SILT-LADEN WATER BE ALLOWED TO ENTER SENSITIVE AREAS. BARRIERS SHALL BE CHECKED THROUGH SETTLING BASINS AND EROSION CONTROL DEVICES TO PREVENT SENSITIVE AREAS.

## NPDES GENERAL NOTES:

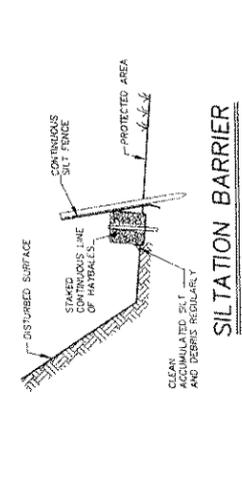
1. THIS PLAN IS INTENDED TO MEET THE REQUIREMENTS OF THE NATIONAL STORM WATER POLLUTION DISCHARGE ELIMINATION SYSTEM (NSPDES) OF SECTION 402 OF THE FEDERAL CLEAN WATER ACT. THE WORK IS MORE THAN 1 ACRE OF TOTAL DISTURBED AREA REQUIRING THE SUBMITTAL OF A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) FOR THIS SITE.
2. IT IS ANTICIPATED THAT THE SITE AS DESIGNED WILL MEET THE CRITERIA FOR A NPDES GENERAL PERMIT. THE SUBMISSION OF THE NPDES NOTICE OF INTENT (NOI) AND THIS PLAN AND SUPPORTING DOCUMENTATION TO THE ACTION BOARD FOR REVIEW AND APPROVAL SHALL BE THE FIRST STEP IN THE CONSTRUCTION OF CONSTRUCTION PERMITS.

## NPDES RECORD REQUIREMENTS:

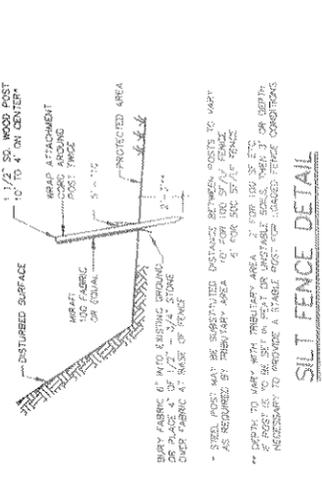
1. RECORDS MUST BE MAINTAINED BY THE PERMITTEE FOR A PERIOD OF THREE (3) YEARS FROM THE DATE OF STABILIZATION OF THE SITE AND/OR MECHANICAL STABILIZATION THROUGHOUT.
2. ALL INSPECTIONS SHALL BE CONDUCTED BY QUALIFIED PERSONNEL WHO SHALL MAINTAIN RECORDS OF ALL INSPECTIONS AND THE RESULTS THEREOF. THE RECORDS SHALL BE AVAILABLE TO THE ACTION BOARD AT ALL TIMES.
3. INSPECTIONS ARE REQUIRED DURING SITE ALTERATIONS A MINIMUM OF ONCE EVERY SEVEN (7) DAYS WHILE SURFACES ARE UNSTABILIZED.
4. INSPECTIONS ARE REQUIRED WITHIN 24 HOURS OF STORMS WHICH PRODUCE 0.5" OF PRECIPITATION OR GREATER.
5. WHEN THE SITE IS FULLY STABILIZED, INSPECTIONS SHALL BE CONDUCTED AT MONTHLY INTERVALS FOR A PERIOD OF 3 YEARS.

## INSPECTION REQUIREMENTS:

1. ALL INSPECTIONS SHALL BE CONDUCTED BY QUALIFIED PERSONNEL WHO SHALL MAINTAIN RECORDS OF ALL INSPECTIONS AND THE RESULTS THEREOF. THE RECORDS SHALL BE AVAILABLE TO THE ACTION BOARD AT ALL TIMES.
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4. WHEN THE SITE IS FULLY STABILIZED, INSPECTIONS SHALL BE CONDUCTED AT MONTHLY INTERVALS FOR A PERIOD OF 3 YEARS.



## SILT FENCE DETAIL



## TEMPORARY DEWATERING AREA

NOTE: TOTAL VOLUME OF TRAP TO EQUAL OR EXCEED VOLUME OF 0.5" PER ACRE OF UN-STABILIZED AREA.

1. ALL STONE SHALL BE WASHED AND SCREENED TO REMOVE ALL MATERIALS LARGER THAN 1/2\"/>

2. ALL STONE SHALL BE WASHED AND SCREENED TO REMOVE ALL MATERIALS LARGER THAN 1/2\"/>

3. ALL STONE SHALL BE WASHED AND SCREENED TO REMOVE ALL MATERIALS LARGER THAN 1/2\"/>

## PRE-CONSTRUCTION:

1. AN EROSION CONTROL BARRIER (SEE BELOW) SHALL BE INSTALLED AS DEPICTED ON THE SITE PLAN BETWEEN THE AREAS TO BE DISTURBED AND WETLAND AREAS. THIS BARRIER SHALL BE INSTALLED PRIOR TO THE START OF CONSTRUCTION AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. THE EROSION CONTROL BARRIERS AS SHOWN ON THE SITE PLAN ARE THE MINIMUM REQUIRED TO PROTECT THE ON & OFF SITE DRAINAGE SYSTEMS.
2. PHOTOGRAPHS AND/OR VIDEO IMAGES OF THE PRE-CONSTRUCTION CONDITION OF THE SITE AND SURROUNDING AREAS, ESPECIALLY THE ADJACENT STREETS SHALL BE TAKEN, DEVELOPED AND DATED. A COPY OF THESE IMAGES SHALL BE SUBMITTED TO THE ACTION BOARD AND THE TOWN OF ACTON. THESE IMAGES SHALL BE USED TO VERIFY THE PRE-CONSTRUCTION CONDITION OF THE AREA BEING DISTURBED AND TO REPRODUCE THE PRE-CONSTRUCTION CONDITION OF THE AREA BEING DISTURBED FOR FUTURE REFERENCE.
3. THE CONTRACTOR SHALL ESTABLISH A STAGING AREA FOR THE STORAGE OF MATERIALS. MATERIALS SHALL BE STORED IN A STAGING AREA THAT IS OUTSIDE OF THE 100' WETLANDS BUFFER ZONE. THE STAGING AREA SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
4. IN THE STAGING AREA, THE CONTRACTOR SHALL HAVE A STOCKPILE OF MATERIALS REQUIRED TO CONTROL EROSION ON-SITE TO BE USED TO SUPPLEMENT OR REPAIR EROSION CONTROL DEVICES. THESE MATERIALS SHALL INCLUDE, BUT ARE NOT LIMITED TO, HAYBALES, SILT FENCE AND CRUSHED STONE.
5. ANY REFUELING OF CONSTRUCTION VEHICLES AND EQUIPMENT SHALL TAKE PLACE IN AN AREA THAT IS OUTSIDE OF THE 100' WETLANDS BUFFER ZONE. ALL OIL AND GREASE SHALL BE COLLECTED AND STORED IN A CONTAINER. ALL OIL AND GREASE SHALL BE DISPOSED OF AT AN APPROVED LOCATION AND SHALL NOT BE CONDUCTED IN PROXIMITY TO WETLANDS OR OVERFLOW DRAINAGE SYSTEMS.
6. NO ON-SITE DISPOSAL OF SOLID WASTE, INCLUDING BUILDING MATERIALS IS ALLOWED IN THE 100 FOOT BUFFER ZONE. THE BURIAL OF STUMPS, CONSTRUCTION DEBRIS OR OTHER MATERIALS SHALL NOT BE ALLOWED ANYWHERE ON-SITE.
7. NO MATERIALS SHALL BE DISPOSED OF INTO THE WETLANDS OR EXISTING OR PROPOSED DRAINAGE SYSTEMS. ALL WASTE SHALL BE STORED IN A CONTAINER AND SHALL BE REMOVED FROM THE SITE AS SOON AS FEASIBLE AS THE CLEANING OF EQUIPMENT IS PROHIBITED IN AREAS WHERE THE WASH-WATER WILL DRAIN DIRECTLY TO THE DRAINAGE SYSTEMS.
8. CONTRACTOR IS RESPONSIBLE FOR DUST CONTROL WHICH SHALL INCLUDE STREET SWEEPING OF ALL PAVED SURFACES WITHIN THE SITE AND OFF-SITE AREAS THAT ARE IMPACTED BY SITE CONSTRUCTION ON A REGULAR BASIS. AS NECESSARY, MEASURES SHALL BE TAKEN TO PREVENT DUST FROM BEING BLOWN INTO ADJACENT AREAS. SUCH BARRIERS SHALL ACT AS THE LIMIT OF DISTURBANCE (UPLANDS) OF THIS LINE. SUCH BARRIERS (WITHIN THE 25' OFFSET) SHALL ONLY BE CHAINED-OUT WITH THE APPROVAL OF THE CONSERVATION COMMISSION OR THEIR APPOINTED AGENT.
9. UNLESS OTHERWISE SHOWN OR SPECIFIED ON THE PLANS, NO DISTURBANCE WITHIN THE 100' BUFFER ZONE SHALL BE ALLOWED. ALL DISTURBANCE SHALL BE RESTORED TO ORIGINAL CONDITIONS OR BETTER. ALL DISTURBANCE SHALL BE RESTORED TO ORIGINAL CONDITIONS OR BETTER. ALL DISTURBANCE SHALL BE RESTORED TO ORIGINAL CONDITIONS OR BETTER.
10. CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION CONTROL ON-SITE AND SHALL UTILIZE EROSION CONTROL MEASURES WHERE NEEDED, REGARDLESS OF WHETHER THE MEASURES ARE SPECIFIED HEREIN. ON THE PLAN OR IN ANY ORDER OF CONDITIONS.

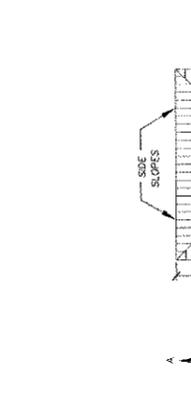
## GENERAL CONSTRUCTION REQUIREMENTS:

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## LANDSCAPING:

1. LANDSCAPING SHALL BE CONDUCTED AS SOON AS POSSIBLE TO PROVIDE PERMANENT STABILIZATION OF UNDISTURBED SURFACES.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION CONTROL ON-SITE AND SHALL UTILIZE EROSION CONTROL MEASURES WHERE NEEDED, REGARDLESS OF WHETHER THE MEASURES ARE SPECIFIED HEREIN. ON THE PLAN OR IN ANY ORDER OF CONDITIONS.
3. TRENCH EXCAVATIONS SHALL BE LIMITED TO THE MINIMUM LENGTH REQUIRED FOR DAILY UTILITY INSTALLATION. ALL TRENCHES SHALL BE BACKFILLED AS SOON AS POSSIBLE.

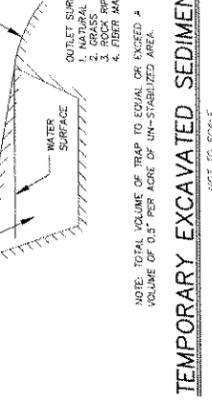
## ARMORED DIKE



## HAYBALE DIKE



## TEMPORARY EXCAVATED SEDIMENT TRAP



## TEMPORARY CONSTRUCTION ENTRANCE



## TEMPORARY DEWATERING AREA



# DRAINAGE SYSTEM OPERATIONS & MAINTENANCE PLAN

## STORM WATER COLLECTION SYSTEM:

1. THE STORMWATER COLLECTION SYSTEM SERVING THIS SITE IS INTENDED TO BOTH PREVENT AND COLLECT RUNOFF FROM THE DISTURBED AREAS. THIS SYSTEM SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD AND SHALL BE MAINTAINED THROUGHOUT THE LIFE OF THE PROJECT. THE STORMWATER COLLECTION SYSTEM SHALL BE MAINTAINED THROUGHOUT THE LIFE OF THE PROJECT. THE STORMWATER COLLECTION SYSTEM SHALL BE MAINTAINED THROUGHOUT THE LIFE OF THE PROJECT.
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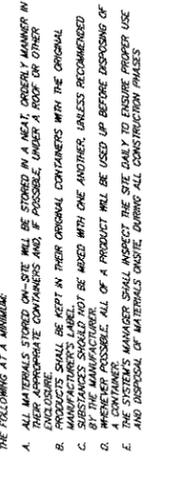
## OPERATIONS:

1. GOOD HOUSE KEEPING AND MATERIAL MANAGEMENT REDUCE THE RISK OF SPILLS OR RUNOFF. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY.
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## MAINTENANCE:

1. PARKING AREAS, ROAD AND ACCESSWAYS AND GUTTERS SHALL BE KEPT CLEAR OF DEBRIS AND ACCUMULATION ON A REGULAR BASIS. AT A MINIMUM, A SPRING AND ALL CLEANING SHALL BE CONDUCTED IMMEDIATELY AFTER EACH RAINFALL EVENT.
2. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY.
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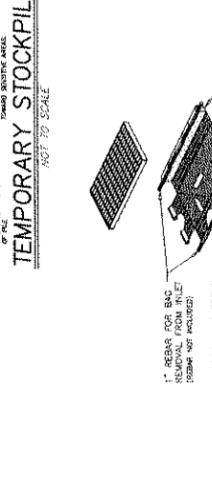
## TEMPORARY STOCKPILE



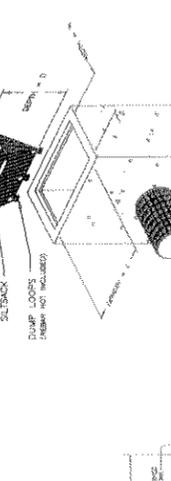
## EROSION AND SEDIMENTATION CONTROL PLAN



## TEMPORARY EXCAVATED SEDIMENT TRAP



## TEMPORARY CONSTRUCTION ENTRANCE



## TEMPORARY DEWATERING AREA



## TEMPORARY DEWATERING AREA

NOTE: TOTAL VOLUME OF TRAP TO EQUAL OR EXCEED VOLUME OF 0.5" PER ACRE OF UN-STABILIZED AREA.

1. ALL STONE SHALL BE WASHED AND SCREENED TO REMOVE ALL MATERIALS LARGER THAN 1/2\"/>

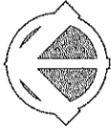
2. ALL STONE SHALL BE WASHED AND SCREENED TO REMOVE ALL MATERIALS LARGER THAN 1/2\"/>

3. ALL STONE SHALL BE WASHED AND SCREENED TO REMOVE ALL MATERIALS LARGER THAN 1/2\"/>



**Hawk Design, Inc.**  
Landscape Architecture  
Land Planning  
Roslindale, MA  
617-242-9300  
info@hawkdesigninc.com

STATE OF MASSACHUSETTS  
LANDSCAPE ARCHITECTURE BOARD  
REGISTERED PROFESSIONAL LANDSCAPE ARCHITECT  
NO. 10100  
HAWK DESIGN, INC. 100 WASHINGTON STREET  
ROSLINDALE, MA 02127



Date: 10/19/05

Revisions:

No. 308 Location



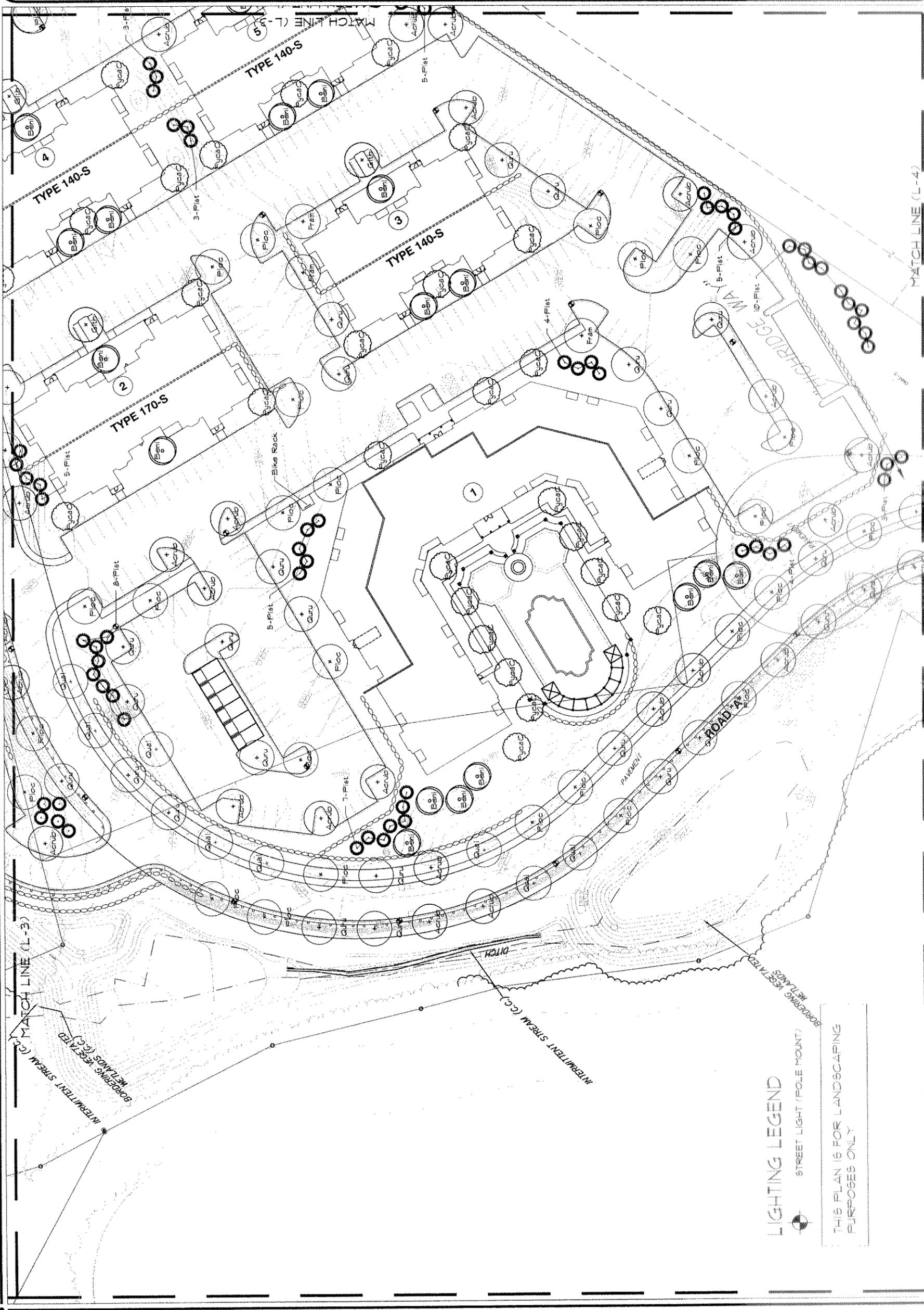
**Woodlands at Laurel Hill**  
Action / Westford, Mass  
Woodlands at Laurel Hill, LLC

Drawn By: ELL Checked By: TM

Landscape  
Plan

Scale: 1" = 30'

Sheet #  
**1-1**



**LIGHTING LEGEND**

STREET LIGHT (POLE MOUNT)



THIS PLAN IS FOR LANDSCAPING  
PURPOSES ONLY



**Hawk Design, Inc.**  
Landscape Architecture  
Land Planning  
Boston, MA  
617-242-6300  
info@hawkdesigninc.com

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Date: 10/19/05

Revisions:

No. 06 Description:



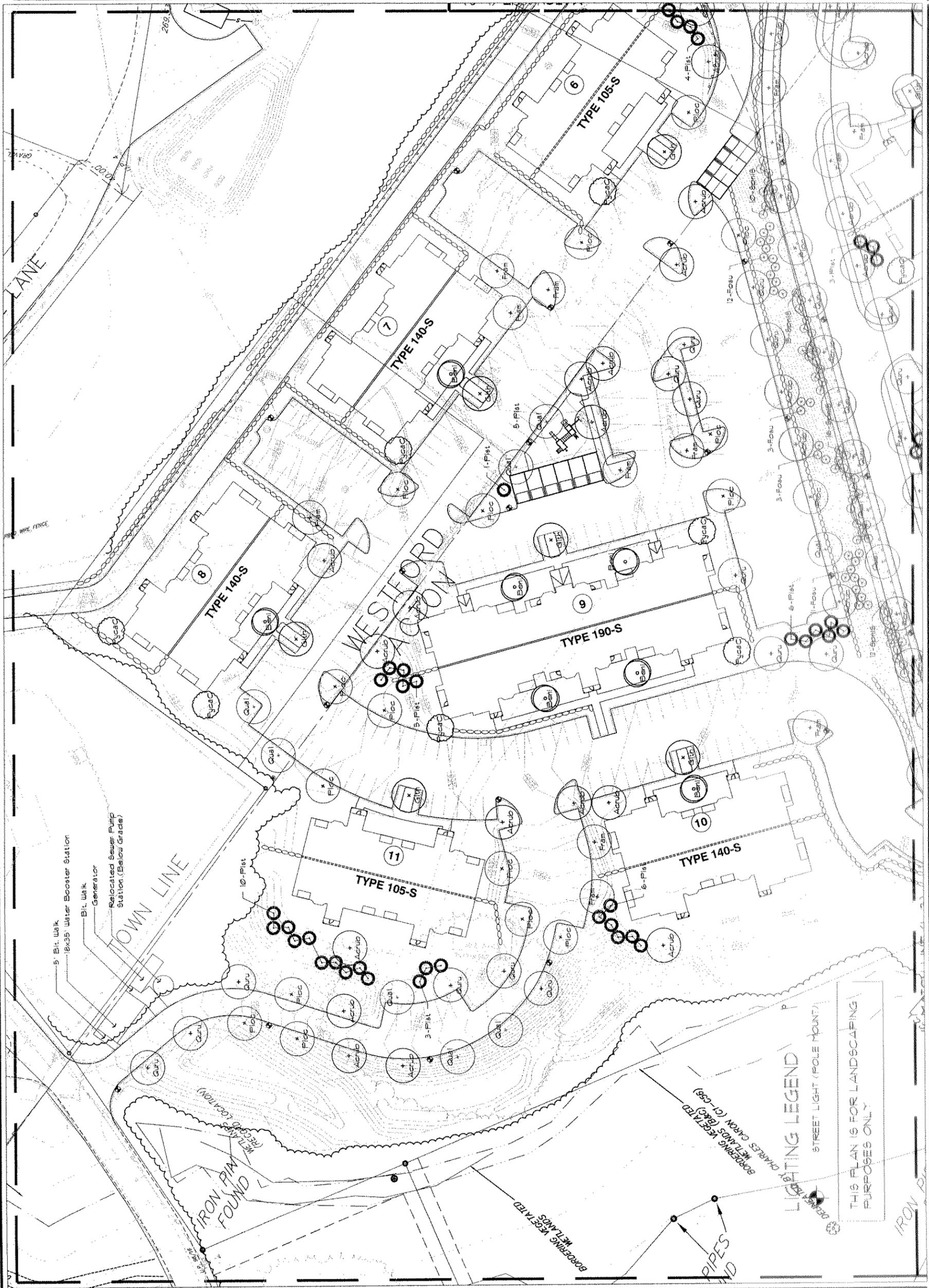
**Woodlands at Laurel Hill**  
Action / Westford, Mass  
Woodlands at Laurel Hill, LLC

Drawn By: B.A. Checked By: T.M.

Landscape Plan

Scale: 1"=30'

Sheet: **1-2**











**Hawk Design, Inc.**  
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Landscape Planning  
Boston, MA  
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WOODLANDS AT LAUREL HILL  
LUXURY APARTMENTS  
LAUREL HILL  
TOWNHOUSES  
OMNI PROPERTIES



Date: 10/19/05  
Revisions:  
No. Date Description

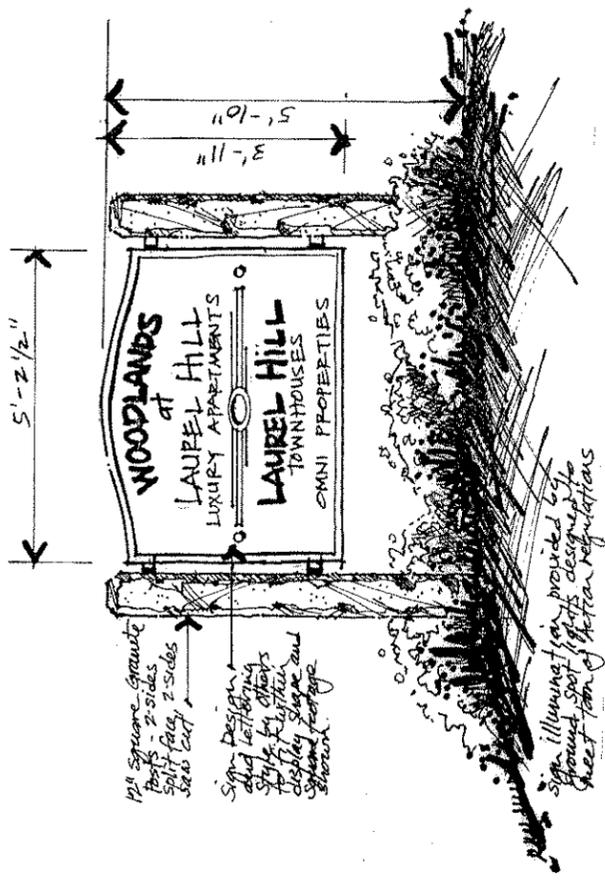


**Woodlands at Laurel Hill**  
Action / Westford, Mass  
Woodlands at Laurel Hill, LLC

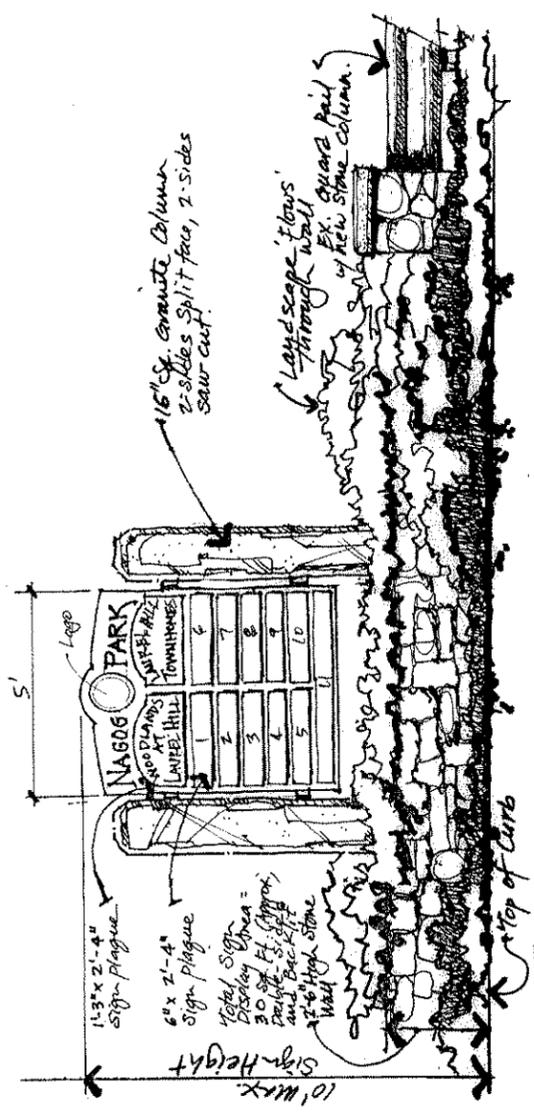
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Conceptual  
Signage  
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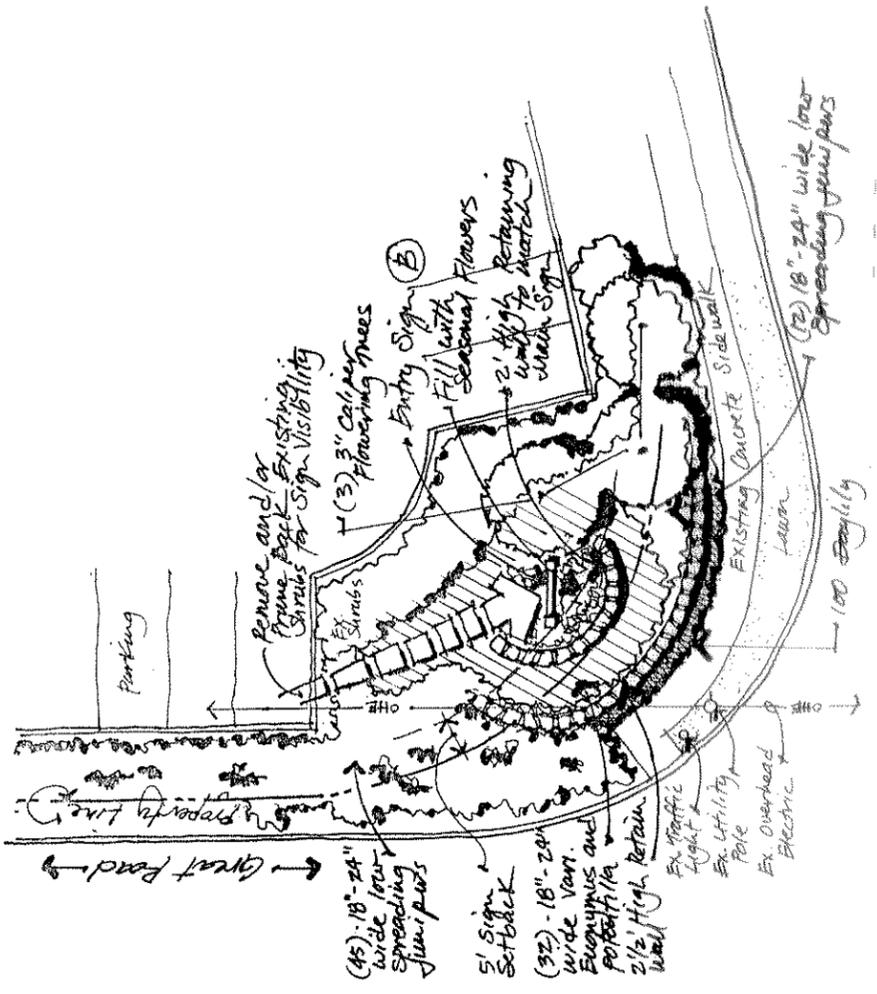
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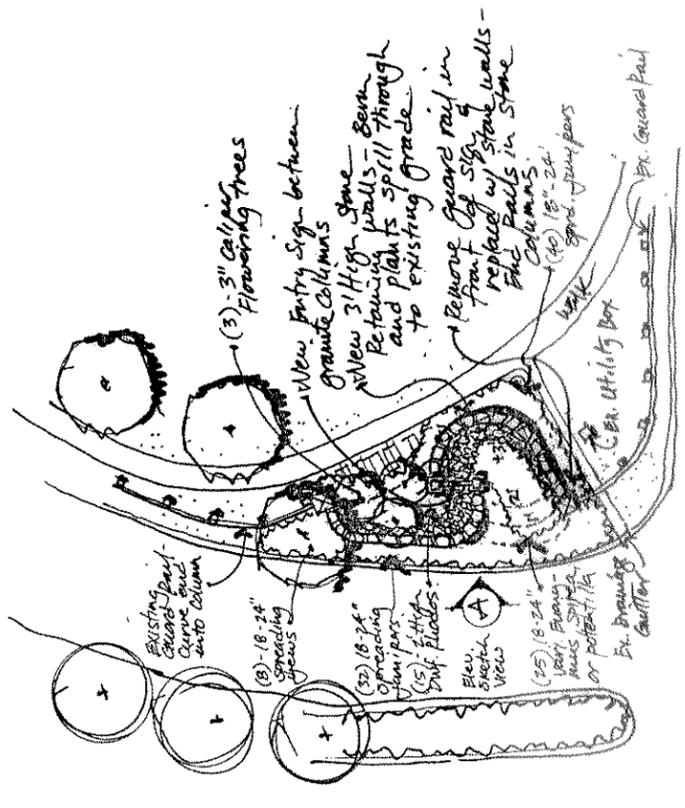
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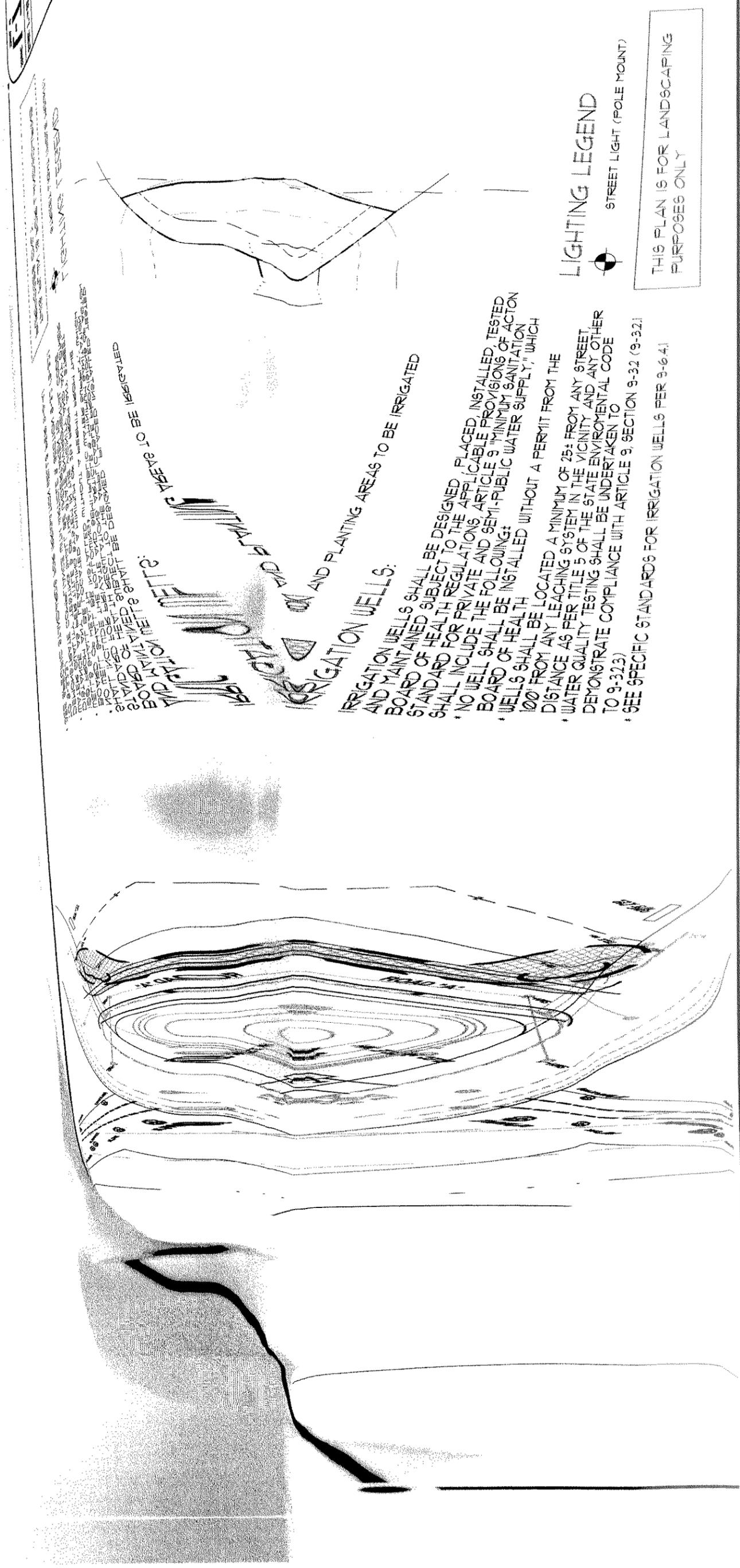
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Entry Sign B Plan (No Scale)



Entry Sign A Plan (No Scale)



WOODLANDS AT LAUREL HILL  
 3800 BROADWAY BLVD  
 WOODLANDS AT LAUREL HILL, LLC  
 3800 BROADWAY BLVD

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WOODLANDS AT LAUREL HILL  
 3800 BROADWAY BLVD  
 WOODLANDS AT LAUREL HILL, LLC  
 3800 BROADWAY BLVD

**LIGHTING LEGEND**



STREET LIGHT (POLE MOUNT)

THIS PLAN IS FOR LANDSCAPING PURPOSES ONLY

IRRIGATION WELLS SHALL BE DESIGNED, PLACED, INSTALLED, TESTED AND MAINTAINED SUBJECT TO THE APPLICABLE PROVISIONS OF ACTION BOARD OF HEALTH REGULATIONS, ARTICLE 9 "MINIMUM SANITATION STANDARD FOR PRIVATE AND SEMI-PUBLIC WATER SUPPLY," WHICH SHALL INCLUDE THE FOLLOWING:

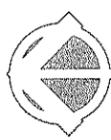
- \* NO WELL SHALL BE INSTALLED WITHOUT A PERMIT FROM THE BOARD OF HEALTH
- \* WELLS SHALL BE LOCATED A MINIMUM OF 25' FROM ANY STREET, DISTANCE AS PER TITLE 5 OF THE STATE ENVIRONMENTAL CODE DEMONSTRATE COMPLIANCE WITH ARTICLE 9, SECTION 9-32.1
- \* SEE SPECIFIC STANDARDS FOR IRRIGATION WELLS PER 9-6.4.

WOODLANDS AT LAUREL HILL  
 3800 BROADWAY BLVD  
 WOODLANDS AT LAUREL HILL, LLC  
 3800 BROADWAY BLVD



**Hawk Design, Inc.**  
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Land Planning  
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Date: 10/19/05

Revisions:  
No. 02: Clarified



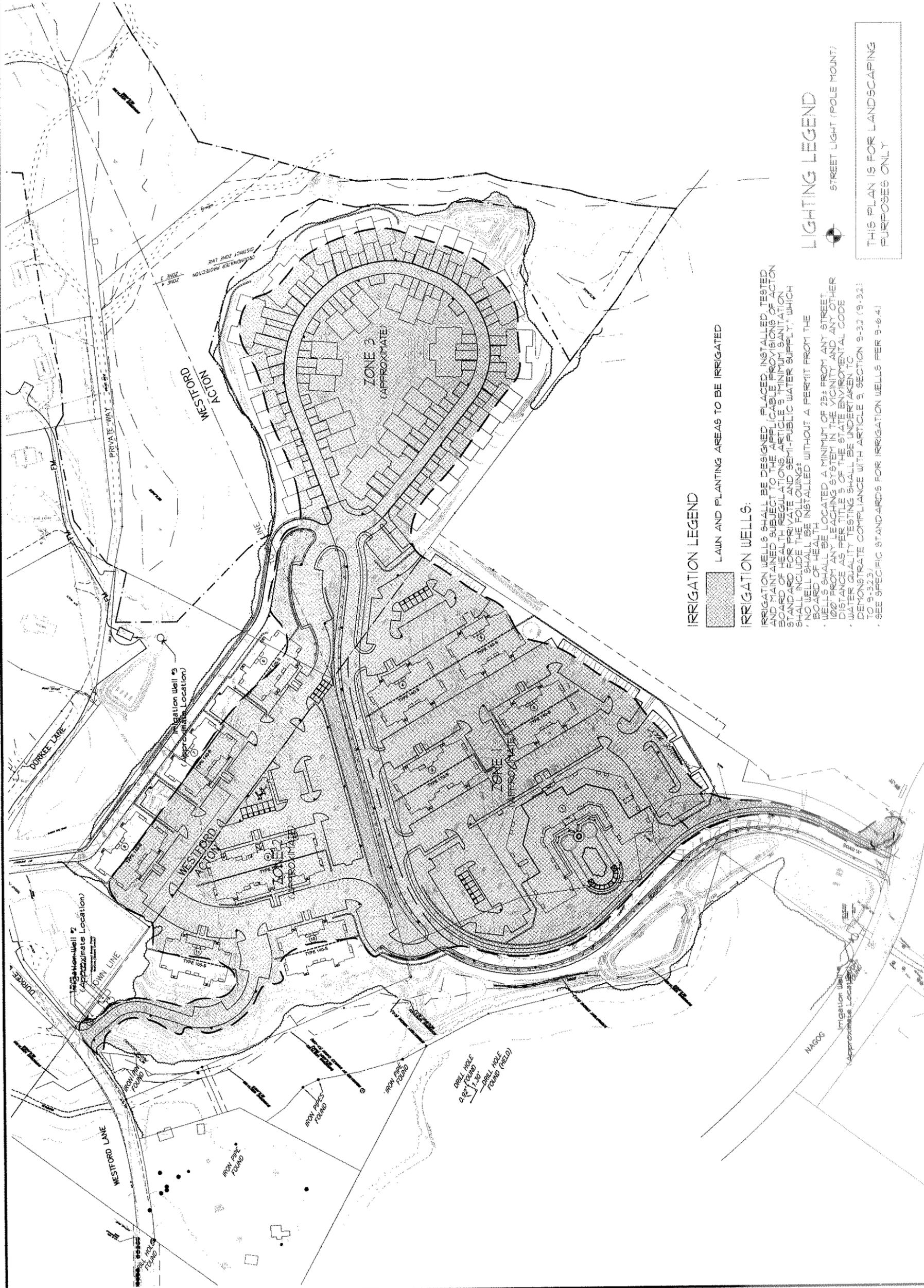
**Woodlands at Laurel Hill**  
Acton / Westford, Mass  
Woodlands at Laurel Hill, LLC

Drawn By: B.L. / Checked By: T.M.

Irrigation  
APP  
PLAN

Scale: 1" = 80'

Sheet: **1-7**  
Sheet #



**IRRIGATION LEGEND**

■ LAWN AND PLANTING AREAS TO BE IRRIGATED

**IRRIGATION WELLS:**

IRRIGATION WELLS SHALL BE DESIGNED, PLACED, INSTALLED, TESTED AND MAINTAINED SUBJECT TO THE APPLICABLE PROVISIONS OF ACTON BOARD OF HEALTH REGULATIONS, ARTICLE 9 "MINIMUM SANITATION STANDARD FOR PRIVATE AND SEMI-PUBLIC WATER SUPPLY," WHICH SHALL INCLUDE THE FOLLOWING:  
 • NO WELL SHALL BE INSTALLED WITHOUT A PERMIT FROM THE BOARD OF HEALTH.  
 • WELLS SHALL BE LOCATED A MINIMUM OF 25' FROM ANY STREET, 100' FROM ANY LEACHING SYSTEM IN THE VICINITY AND ANY OTHER DISTANCE AS PER TITLE 5 OF THE STATE ENVIRONMENTAL CODE.  
 • WATER QUALITY TESTING SHALL BE UNDERTAKEN TO DEMONSTRATE COMPLIANCE WITH ARTICLE 9, SECTION 9-32 (9-32:1 TO 9-32:3).  
 • SEE SPECIFIC STANDARDS FOR IRRIGATION WELLS PER 9-6.4.

**LIGHTING LEGEND**

○ STREET LIGHT (POLE MOUNT)

THIS PLAN IS FOR LANDSCAPING PURPOSES ONLY



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Date: 10/19/05

Revisions:

Ver. 04a Issued



**Woodlands at Laurel Hill**  
Action / Westford, Mass  
Woodlands at Laurel Hill, LLC

Drawn By: BJJ, Checked By: TM

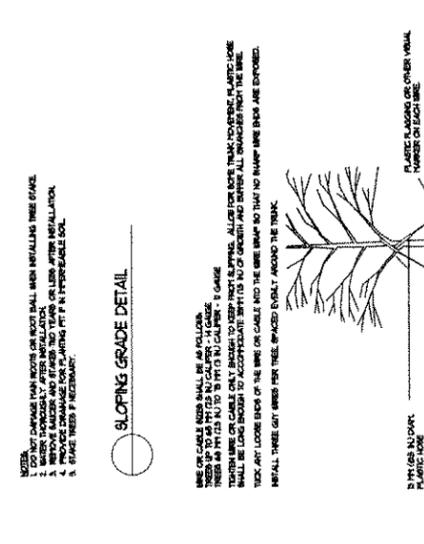
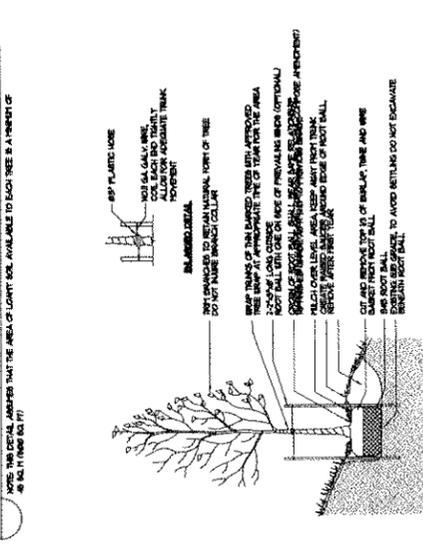
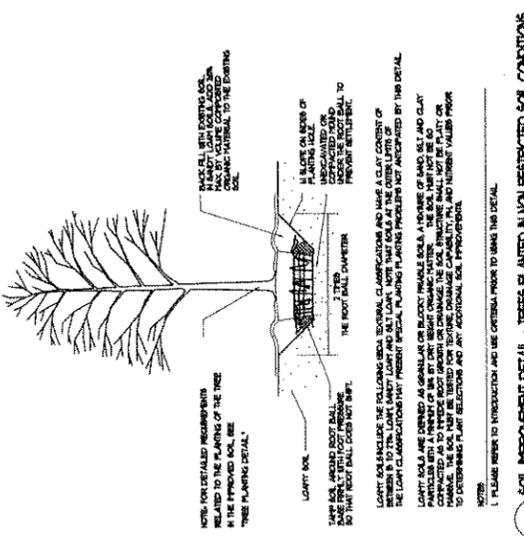
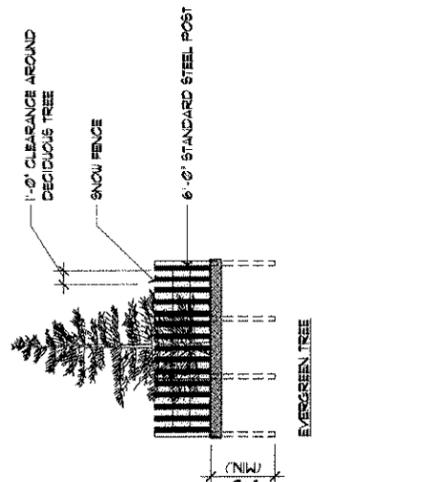
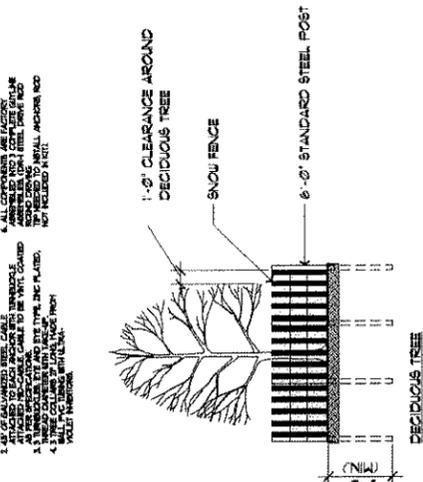
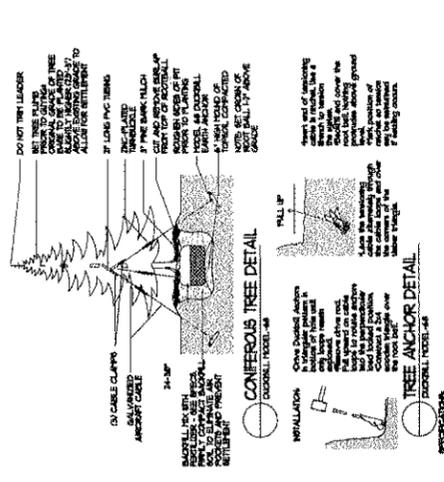
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Scale: AS NOTED

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**PLANTING NOTES**

- NOTIFY DIG-SAFE AND LOCAL AUTHORITIES PRIOR TO ANY TYPE OF SITE PREPARATION OR CONSTRUCTION AT 1-800-DIG-SAFE.
- ALL PLANTS TO HAVE THE SAME RELATIONSHIP TO FINISH GRADE AFTER SETTLEMENT AS TO THEIR ORIGINAL GRADE BEFORE DIGGING. LOCATE PLANT COLLAR TWO OR THREE INCHES HIGHER THAN PLANTING SOIL MIX TO INSURE CORRECT FINAL RELATIONSHIP.
- APPLY AN APPROVED ANTI-DESICANT TO ALL PLANTS IN LEAF AT PLANTING TIME, AND TO ALL EVERGREENS BEFORE THEIR FIRST WINTER PLANTING. CONTRACTOR TO ARRANGE FOR ALL PLANTS TO BE PLANTED WITHIN THREE DAYS AFTER DELIVERY TO THE SITE UNLESS OTHERWISE APPROVED BY THE LANDSCAPE ARCHITECT.
- NEVER CUT A LEADER.
- TRIM ONLY BROKEN OR DEAD BRANCHES FROM EVERGREEN PLANTS. THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIAL AND MULCH IN SUFFICIENT QUANTITIES TO COMPLETE PLANTING AS SHOWN ON THE DRAWINGS. DRAWING QUANTITIES TAKE PRECEDENCE OVER PLANT LIST QUANTITIES.
- ALL PLANT MATERIAL SHALL CONFORM TO THE GUIDELINES BY THE AMERICAN STANDARD FOR NURSERY STOCK<sup>1</sup> PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC.
- ALL TREES SHALL HAVE "BEST FACE" SIDE TAGGED AT NURSERY PRIOR TO DELIVERY.
- ALL PLANTS SHALL BE BALLED AND BURLAPPED OR CONTAINERS GROWN UNLESS OTHERWISE APPROVED BY THE LANDSCAPE ARCHITECT.
- CONTRACTOR TO STAKE TREE LOCATIONS FOR APPROVAL BY LANDSCAPE ARCHITECT.
- LANDSCAPE ARCHITECT TO APPROVE IN PLACE ALL SHRUBS, PERENNIALS AND VINES PRIOR TO PLANTING.
- TREES TO RECEIVE A MINIMUM OF THREE INCHES OF MULCH. ALL SHRUBS, VINES AND GROUND COVERS TO RECEIVE A MINIMUM OF TWO INCHES OF MULCH.
- WHERE SPECIFIED, CALIFER SIZE TO BE OVERRIDING FACTOR IN TREE SELECTION.
- STAKE OR GUY ALL TREES AND LARGE EVERGREEN MATERIAL.
- CONTRACTOR TO PROVIDE TWO YEAR GUARANTEE ON ALL MATERIAL. CONTRACTOR TO MAINTAIN ALL PLANTING AND LEANS UNTIL FINAL PROJECT ACCEPTANCE. GUARANTEE PERIOD TO BEGIN AT FINAL PROJECT ACCEPTANCE.
- ALL PLANT MATERIAL SHALL BE INSTALLED PRIOR TO FINAL TOP-DRESSING AND SOODING/SEEDING.
- COORDINATE LANDSCAPE INSTALLATION WITH INSTALLATION OF UNDERGROUND SPRINKLER SYSTEM (LANDSCAPE LIGHTING IF APPLICABLE).
- NO PLANTING BEFORE THE ACCEPTANCE OF ROUGH GRADING.
- CONTRACTOR TO PROVIDE SOIL TESTS IN AREAS DESIGNATED BY LANDSCAPE ARCHITECT IN FIELD FOR EXISTING SOILS TO DETERMINE APPROPRIATE SOIL AMENDMENTS PRIOR TO THE DISTURBANCE OF SITE.
- ALL PLANTING BEDS TO BE TREATED WITH GREEN AND GREEN OR APPROVED EQUAL TO PROHIBIT WEED GERMINATION AND GROWTH PRIOR TO THE SPREADING OF MULCH.
- ALL PERENNIALS ARE TO BE PLANTED INTO DAMP SOIL.
- PLANT LIST: A COMPLETE LIST OF PLANTS INCLUDING A SCHEDULE OF QUANTITIES, SIZES, TYPES AND NAMES IS INCLUDED IN THIS SET OF DRAWINGS. IN THE EVENT OF DISCREPANCIES BETWEEN QUANTITIES OF PLANTS IN THE PLANT LIST AND THE QUANTITIES SHOWN ON THE DRAWINGS, THE PLANT LIST SHALL GOVERN. WHEN MULTIPLE PLANT SPECIES ARE LISTED IN ONE PLANT CATEGORY, THE GOAL IS TO PROVIDE THE BEST PLANTS AVAILABLE AT THE TIME OF INSTALLATION. HAWK DESIGN, INC. SHALL SELECT OR COORDINATE THE SELECTION OF THE APPROPRIATE PLANTS AT LOCAL NURSERIES. HAWK DESIGN HAS THE RIGHT TO REJECT ANY PLANT THAT DOES NOT MEET THE SPECIFICATIONS LISTED IN THE PLANT TABLE.
- PLANT SUBSTITUTION ARE NOT ALLOWED UNLESS APPROVED BY HAWK DESIGN, INC.
- ALL DISTURBED AREAS TO BE LOAMED AND SEEDED AND BLENDED INTO EXISTING GRADE AND CONDITIONS (REFER TO ENGINEER'S SOIL STABILIZATION AND EROSION CONTROL PLAN FOR FURTHER INFORMATION).
- CONTRACTOR SHALL, IF APPLICABLE, REVIEW WITH CLIENT ALL IRRIGATION PROCEDURES AND PROCESSES (i.e. TIMING, ZONES AND ALL OTHER ITEMS INVOLVED WITH THE IRRIGATION SYSTEM).



NOTE: TREE COLLAR SHOULD BE PLACED AT THE POINT OF THE TREE TRUNK WHERE THE SOIL IS MOST SUITABLE FOR PLANTING. THE COLLAR SHOULD BE MADE OF A MATERIAL THAT IS EASY TO REMOVE WITHOUT DAMAGING THE BARK. IF THE COLLAR IS NOT REMOVED, IT SHOULD BE CUT OFF AT THE TIME OF PLANTING.

NOTE: TREE COLLAR SHOULD BE PLACED AT THE POINT OF THE TREE TRUNK WHERE THE SOIL IS MOST SUITABLE FOR PLANTING. THE COLLAR SHOULD BE MADE OF A MATERIAL THAT IS EASY TO REMOVE WITHOUT DAMAGING THE BARK. IF THE COLLAR IS NOT REMOVED, IT SHOULD BE CUT OFF AT THE TIME OF PLANTING.

**NOT FOR CONSTRUCTION**  
 THIS DRAWING IS FOR THE  
 PURPOSES OF OBTAINING STATE  
 AND LOCAL APPROVALS AND ARE NOT  
 INTENDED TO BE USED AS CONSTRUCTION  
 DOCUMENTS.

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1	10/17/05	Issued For Comp. Permit

Revisions

Designed By: *[Signature]*  
 Checked By: *[Signature]*  
 Approved By: *[Signature]*



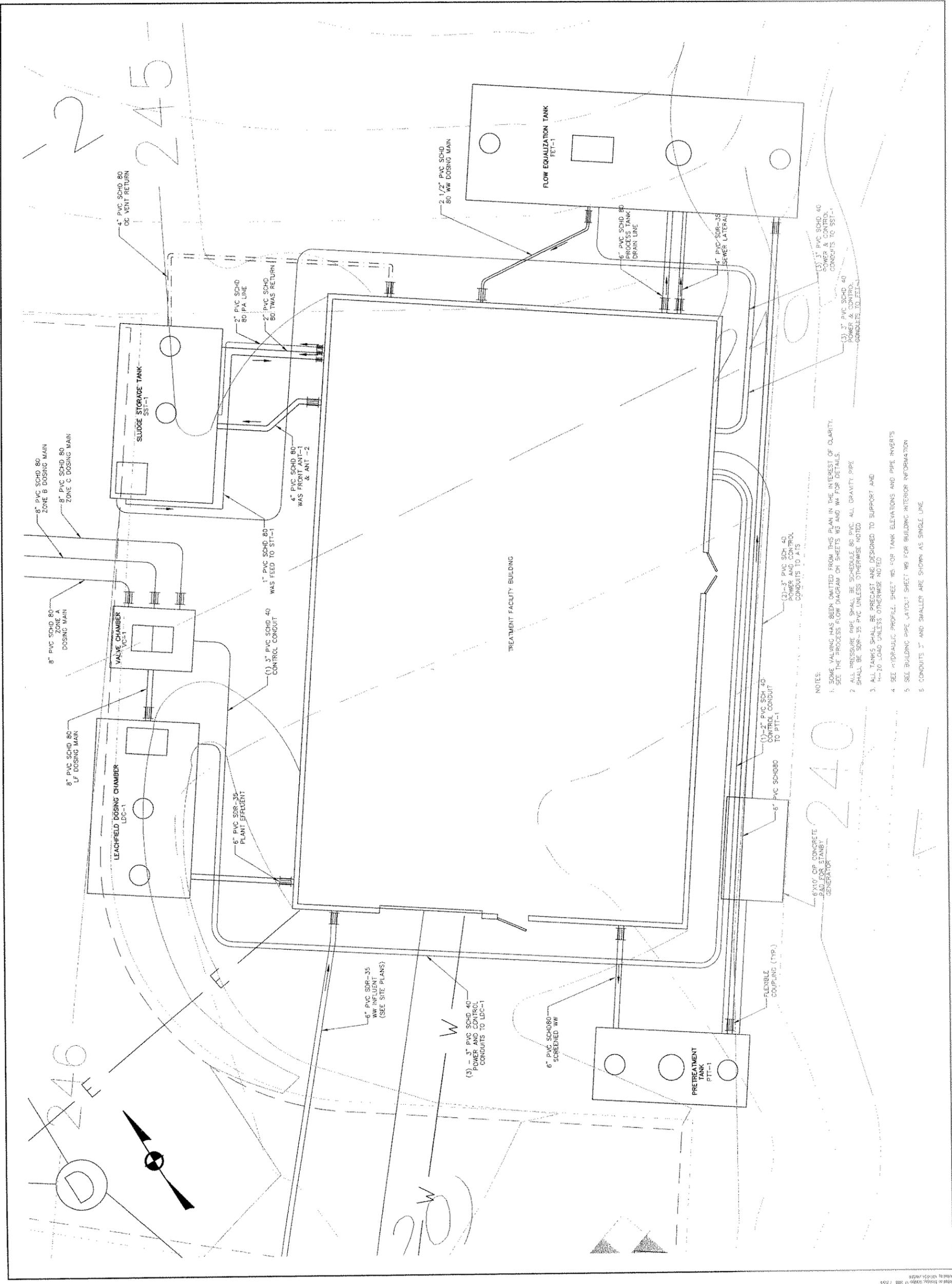
**RIZZO ASSOCIATES**  
 A TETRA TECH COMPANY  
 505 East Street  
 Framingham, MA 01701-9005  
 508-903-2000  
 www.rizzo.com

Project: **Westford-Acton  
 Treatment Company**

Sheet: **Yard Piping  
 Plan**

Scale: 1/4"=1'  
 10/17/05  
 2005 7/28/04

**W7**



- NOTES:**
- SOME VALVING HAS BEEN OMITTED FROM THIS PLAN IN THE INTEREST OF CLARITY. SEE THE PROCESS FLOW DIAGRAM ON SHEETS W3 AND W4 FOR DETAILS.
  - ALL PRESSURE PIPE SHALL BE SCHEDULE 80 PVC. ALL GRAVITY PIPE SHALL BE SDR-35 PVC UNLESS OTHERWISE NOTED.
  - ALL TANKS SHALL BE PRECAST AND DESIGNED TO SUPPORT A 10-20 LOAD UNLESS OTHERWISE NOTED.
  - SEE HYDRAULIC PROFILE, SHEET W5 FOR TANK ELEVATIONS AND PIPE INVERTS.
  - SEE BUILDING PIPE LAYOUT SHEET W6 FOR BUILDING INTERIOR INFORMATION.
  - CONDUITS 1" AND SMALLER ARE SHOWN AS SINGLE LINE.

12/245

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**NOT FOR CONSTRUCTION**  
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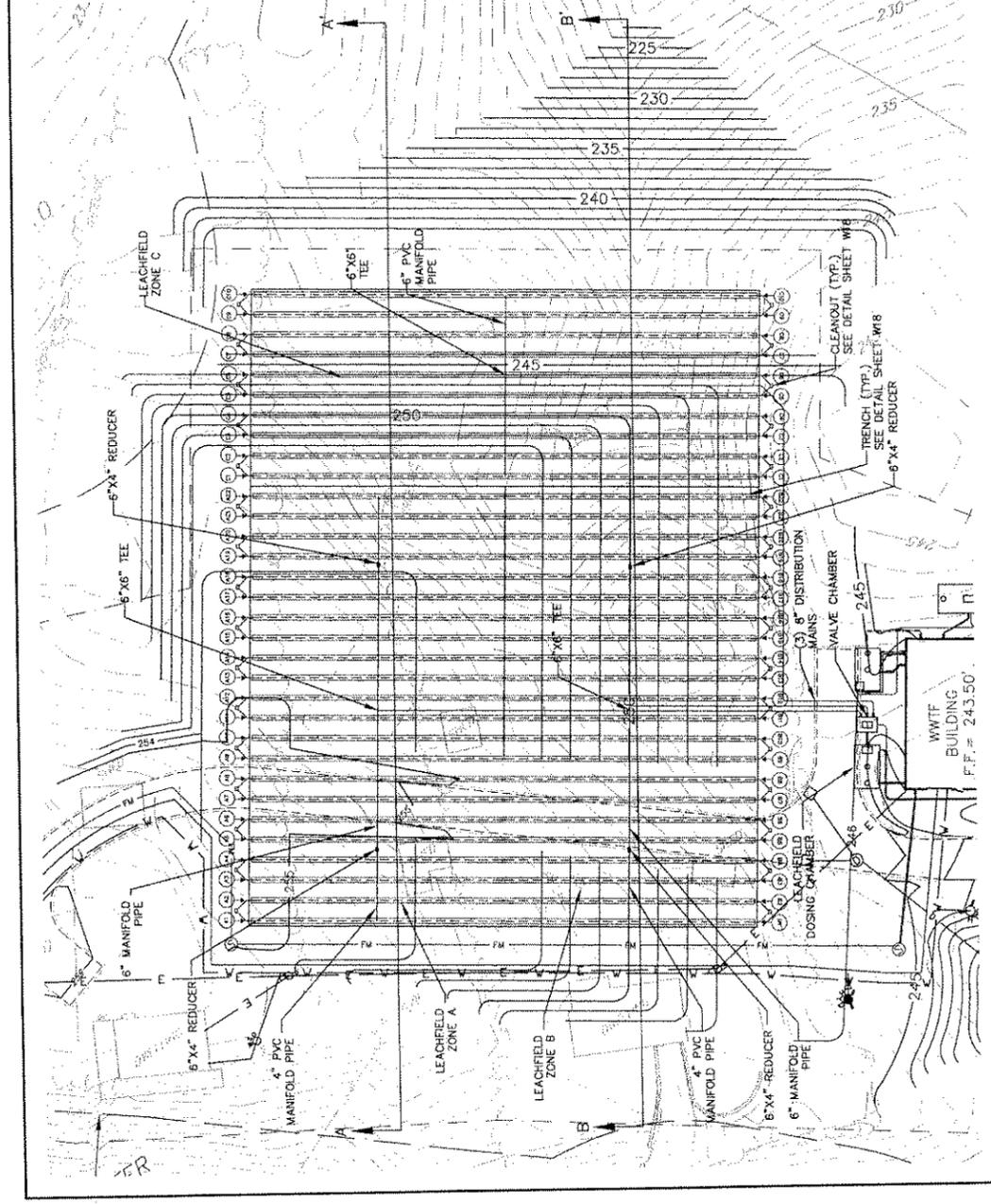
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Revisions



**RIZZO ASSOCIATES**  
 A TETRA TECH COMPANY  
 One Grant Street  
 Framingham, MA 01701-8005  
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**Westford-Acton Treatment Company**  
 Project Title  
 Leachfield Layout & Sections  
 Sheet 2/4  
 Issues AS NOTED  
 08/10/05  
 Date: 10/17/05  
 Figure  
**W17**



**LEACHING TRENCH LAYOUT PLAN**  
 SCALE: 1"=30'

**LEACHING CAPACITY CALCULATIONS**

TOTAL TRENCH LENGTH = 8,400 LF  
 USE 2 FT (W) X 2 FT (D) TRENCHES, 6 FT APPART  
 EFFECTIVE AREA = 6 SQ FT/DF  
 TOTAL EFFECTIVE AREA = (8,500 FT/DF) x (6,400 LF) = 38,400 SQ FT  
 MAX REGULATORY LOADING RATE = 2.5 GPD/SQ FT  
 LEACH-FIELD CAPACITY = 12.5 GPD/SQ FT x (38,400 SQ FT) = 96,000 GPD

**LEACHING TRENCH SCHEDULE**

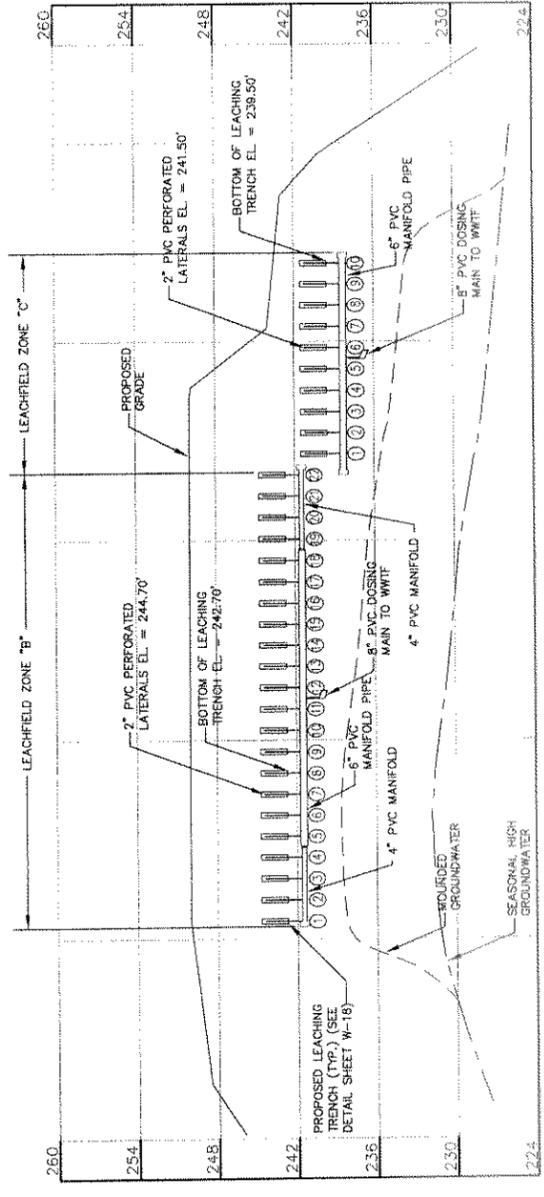
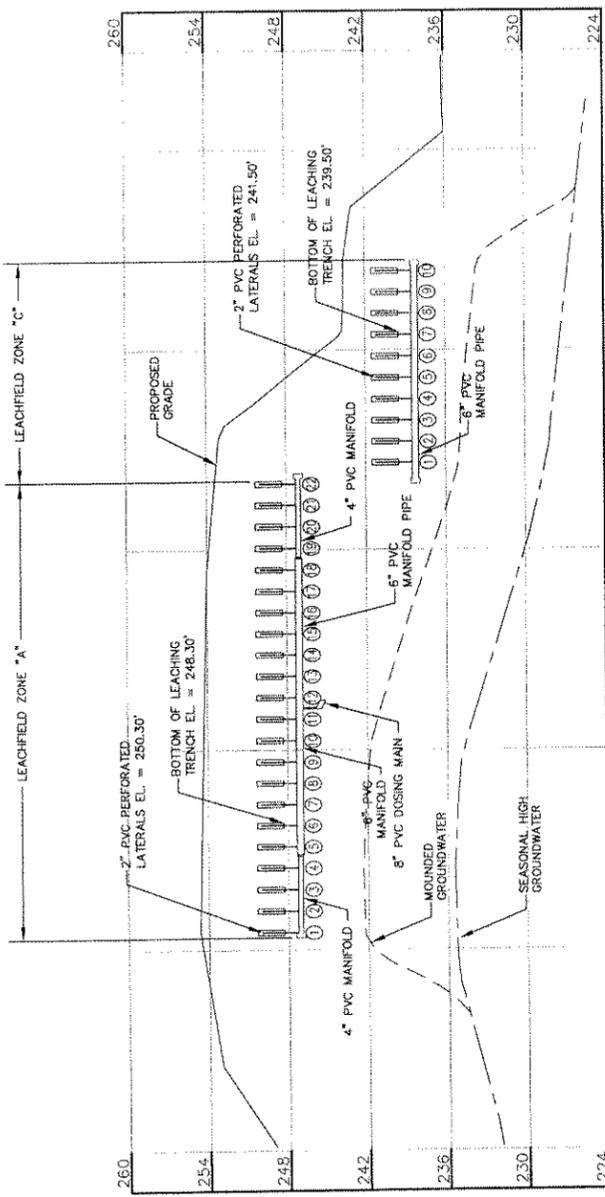
ZONE A - TRENCH SUMMARY			ZONE B - TRENCH SUMMARY			ZONE C - TRENCH SUMMARY		
TRENCH NUMBER	TRENCH LENGTH (FT)	BOT. OF TRENCH ELEVATION (FT)	TRENCH NUMBER	TRENCH LENGTH (FT)	BOT. OF TRENCH ELEVATION (FT)	TRENCH NUMBER	TRENCH LENGTH (FT)	BOT. OF TRENCH ELEVATION (FT)
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2	100	239.5	2	100	239.5	2	100	239.5
3	100	239.5	3	100	239.5	3	100	239.5
4	100	239.5	4	100	239.5	4	100	239.5
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6	100	239.5	6	100	239.5	6	100	239.5
7	100	239.5	7	100	239.5	7	100	239.5
8	100	239.5	8	100	239.5	8	100	239.5
9	100	239.5	9	100	239.5	9	100	239.5
10	100	239.5	10	100	239.5	10	100	239.5
11	100	239.5	11	100	239.5	11	100	239.5
12	100	239.5	12	100	239.5	12	100	239.5
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14	100	239.5	14	100	239.5	14	100	239.5
15	100	239.5	15	100	239.5	15	100	239.5
16	100	239.5	16	100	239.5	16	100	239.5
17	100	239.5	17	100	239.5	17	100	239.5
18	100	239.5	18	100	239.5	18	100	239.5
19	100	239.5	19	100	239.5	19	100	239.5
20	100	239.5	20	100	239.5	20	100	239.5
21	100	239.5	21	100	239.5	21	100	239.5
22	100	239.5	22	100	239.5	22	100	239.5
23	100	239.5	23	100	239.5	23	100	239.5
24	100	239.5	24	100	239.5	24	100	239.5
25	100	239.5	25	100	239.5	25	100	239.5
26	100	239.5	26	100	239.5	26	100	239.5
27	100	239.5	27	100	239.5	27	100	239.5
28	100	239.5	28	100	239.5	28	100	239.5
29	100	239.5	29	100	239.5	29	100	239.5
30	100	239.5	30	100	239.5	30	100	239.5
31	100	239.5	31	100	239.5	31	100	239.5
32	100	239.5	32	100	239.5	32	100	239.5
33	100	239.5	33	100	239.5	33	100	239.5
34	100	239.5	34	100	239.5	34	100	239.5
35	100	239.5	35	100	239.5	35	100	239.5
36	100	239.5	36	100	239.5	36	100	239.5
37	100	239.5	37	100	239.5	37	100	239.5
38	100	239.5	38	100	239.5	38	100	239.5
39	100	239.5	39	100	239.5	39	100	239.5
40	100	239.5	40	100	239.5	40	100	239.5
41	100	239.5	41	100	239.5	41	100	239.5
42	100	239.5	42	100	239.5	42	100	239.5
43	100	239.5	43	100	239.5	43	100	239.5
44	100	239.5	44	100	239.5	44	100	239.5
45	100	239.5	45	100	239.5	45	100	239.5
46	100	239.5	46	100	239.5	46	100	239.5
47	100	239.5	47	100	239.5	47	100	239.5
48	100	239.5	48	100	239.5	48	100	239.5
49	100	239.5	49	100	239.5	49	100	239.5
50	100	239.5	50	100	239.5	50	100	239.5

**GENERAL LEACHFIELD NOTES**

1. LEACHING RESERVE AREAS ARE LOCATED BETWEEN ACTIVE TRENCHES.
2. THE CONTRACTOR SHALL COORDINATE THE PLACEMENT OF ALL BROSNIK CONTROL MEASURES WITH THE GENERAL SITE CONTRACTOR.
3. THE CONTRACTOR SHALL REMOVE THE A AND B HORIZONS OF THE SOIL COLUMN UNDER THE PROPOSED LEACHING AND RESERVE AREAS PRIOR TO THE START OF SYSTEM CONSTRUCTION.
4. ALL FILL MATERIAL SHALL CONSIST OF SELECT GRANULAR OR IMPORTED SOIL MATERIALS. MATERIALS SHALL BE LABORATORY TESTED AND SHALL CONFORM TO THE SOIL GRADATION REQUIREMENTS OF 3.0 SMP 15 255.
5. THE EXCAVATION OF UNSATURABLE MATERIAL SHALL EXTEND FIVE (5) FEET LATERALLY IN ALL DIRECTIONS BEYOND THE OUTER PERIMETER OF EACH LEACHING TRENCH TO THE DEPTH OF ALL EXISTING "COOPERING" PREVIOUS WATERLATERAL ABSORPTION SYSTEM TO THE DEPTH OF ALL EXISTING "COOPERING" PREVIOUS WATERLATERAL ABSORPTION SYSTEM.
6. ALL LEACHFIELD PIPING SHALL BE SCHEDULE 40 PVC UNLESS OTHERWISE NOTED.
7. THE CONTRACTOR SHALL CONDUCT TESTING OF THE SOIL ABSORPTION SYSTEM WITH THE LOCAL SOIL DEP AND THE ENGINEER PRIOR TO SYSTEM COMPLETION.
8. ALL EXISTING SHALL BE PRESERVED AND ACCORDANCE WITH THE LEACHFIELD LAYOUT RECOMMENDATIONS.
9. SEE ALSO "SOIL BORE" MAINS MUST DRAW, PART 1, LEACHFIELD DOSING CHAMBER.

**SECTION A-A'**  
 HORIZ: 1"=30'  
 VERT: 1"=6'

**SECTION B-B'**  
 HORIZ: 1"=30'  
 VERT: 1"=6'



**SECTION C-C'**  
 HORIZ: 1"=30'  
 VERT: 1"=6'

**SECTION A-A'**  
 HORIZ: 1"=30'  
 VERT: 1"=6'